

# SUPPLEMENT.

# The Mining Journal, RAILWAY AND COMMERCIAL GAZETTE:

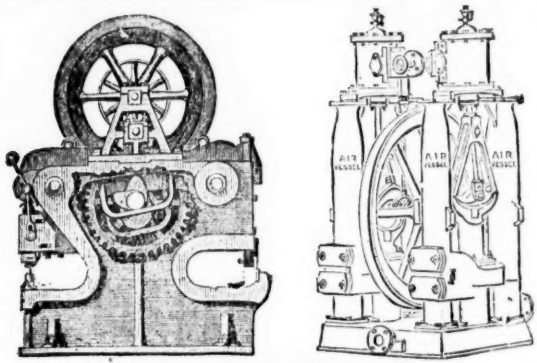
FORMING A COMPLETE RECORD OF THE PROCEEDINGS OF ALL PUBLIC COMPANIES.

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No. 2004.—Vol. XLIV.

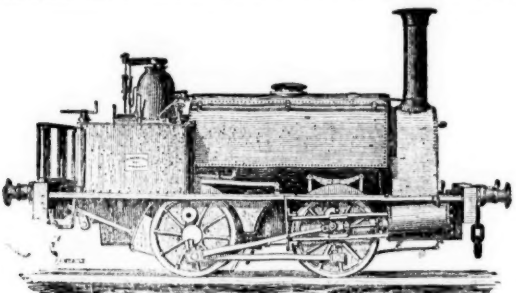
LONDON, SATURDAY, JANUARY 17, 1874.

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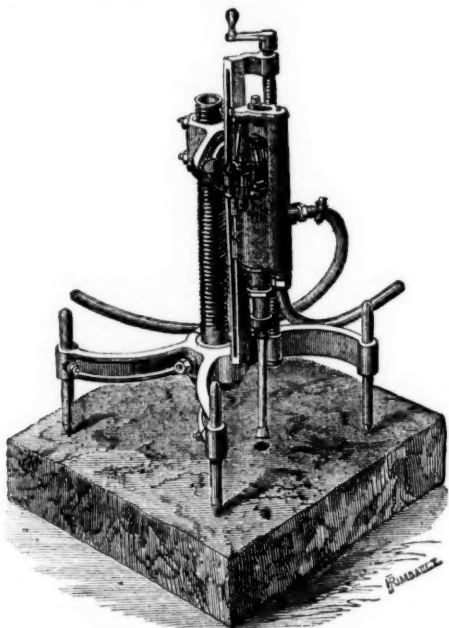
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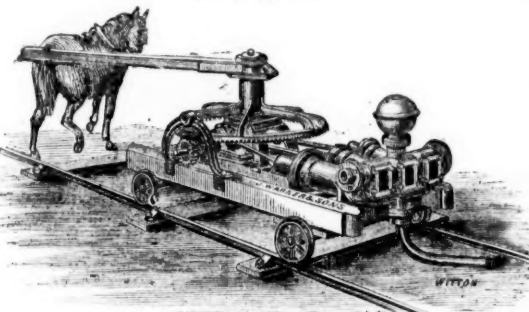
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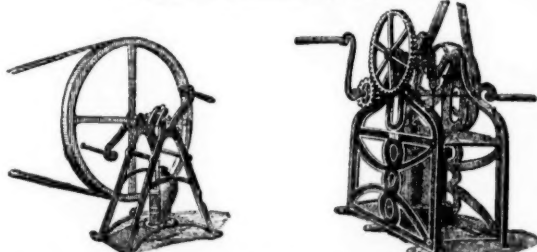


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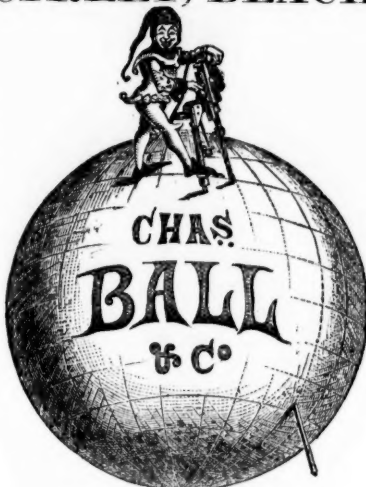
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Each of these Drills is a different Patent, constructed on a separate and distinct principle.



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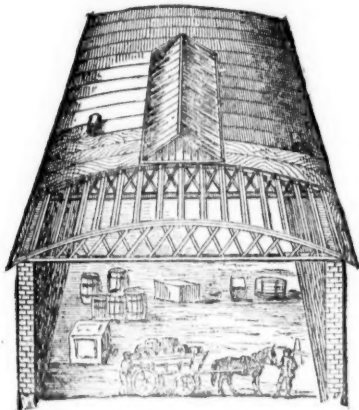
Should other **ROCK DRILLS** or **MINING MACHINERY** be successfully brought out by practical Engineers, Messrs. C. BALL and Co. are prepared, after having had the invention thoroughly tested, to enter into arrangements with the Inventors for the **INTRODUCTION** of such **MACHINES** in this Country and Abroad.

Progress obtained by **CHARLES BALL and Co.'s DRILLS** at the Collieries of Ronchamp:—

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The above drawing shows the construction of this cheap and handsome roof, now much used for covering factories, stores, sheds, farm buildings, &c., the principal of which are double low and strong girders of best pine timber, sheathed with 1-in. boards, supported on the girders by purlins running longitudinally, the whole being covered with patent waterproof roofing felt. These roofs so combine lightness with strength that they can be constructed up to 100 ft. span without extra supports, thus not only affording a clear wide space, but effecting a great saving both in the cost of roof and uprights.

They can be made with or without top lights, ventilators, &c. Felt roofs of any description executed in accordance with plans. Prices for plain roofs from 30s. to 60s. per square, according to span, size, and situation.

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PATENT ROCK PERFORATORS.

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This is the best hand-worked implement for colliery purposes extant. It can be carried about, set up, taken down, and worked by one man. It bores vertically upward as well as in any other direction. The rate of work is at least four times as great as by the usual methods. The hole made is straight and uniform, and, therefore, specially adapted for the use of cartridges.

Price list and description, with list of places where the Perforators are in use, on application as above.

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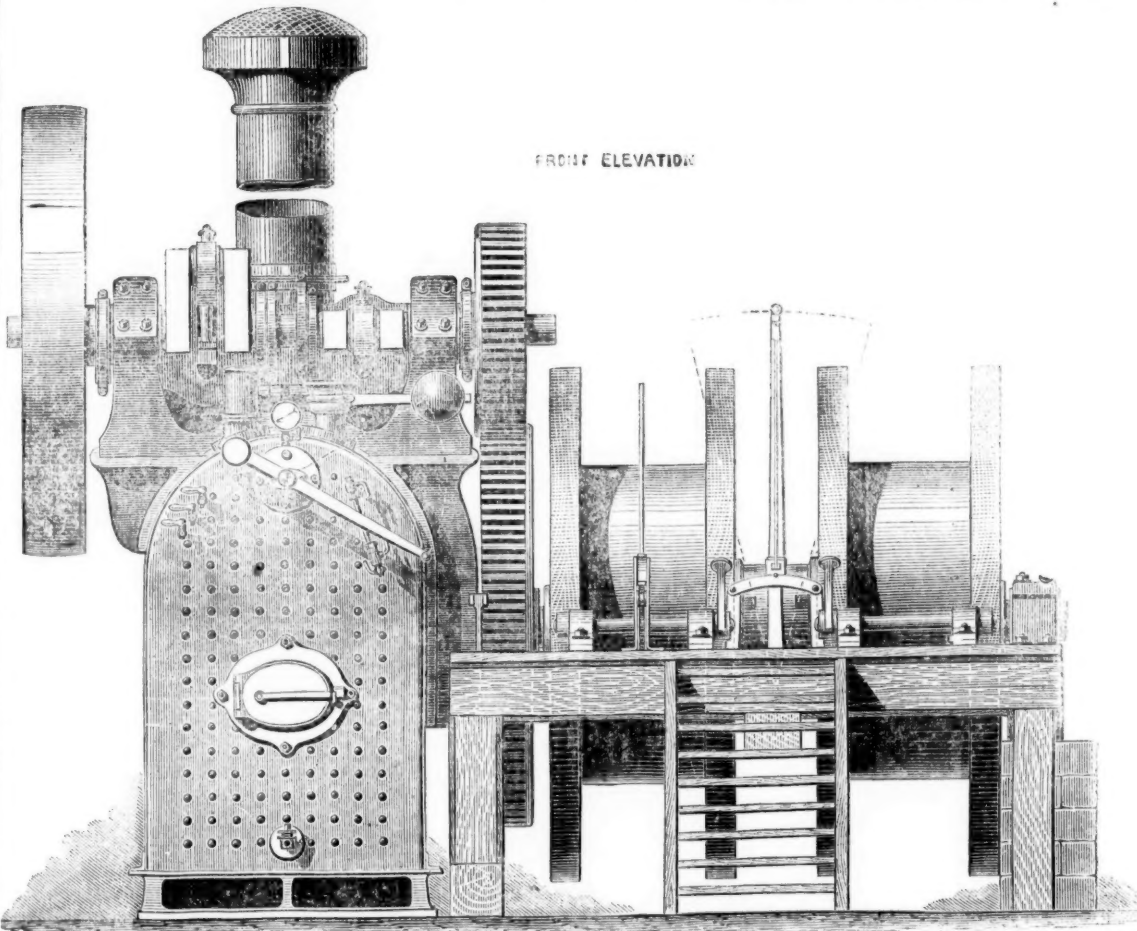
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FRONT ELEVATION

FROM 20 TO 200 EFFECTIVE HORSE-POWER.

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## HAULING & WINDING ENGINE

WITH  
**PATENT DRUM WINDLASSES,**  
FOR MINING PURPOSES.

This Engine is specially commended to Mining Engineers and others, as by its adoption—

Haulage along inclined drifts is easily and cheaply effected;

The expense of sinking new shafts is greatly reduced, neither foundations nor engine-house being required

It is available not only for winding, but for pumping, sawing, &c.—a great desideratum at a large colliery;

It can be very quickly removed (being self-propelling), and fixed in any desired position.

Prices and full particulars on application as above, and also references to view the engine in successful work near Derby, Carnarvon, Haverfordwest, Darlington, Durham, Penzance, and other places.

THESE ENGINES WORK WITH MARVELLOUS ECONOMY IN FUEL.

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### IRON, STEEL, AND GENERAL MERCHANTS,

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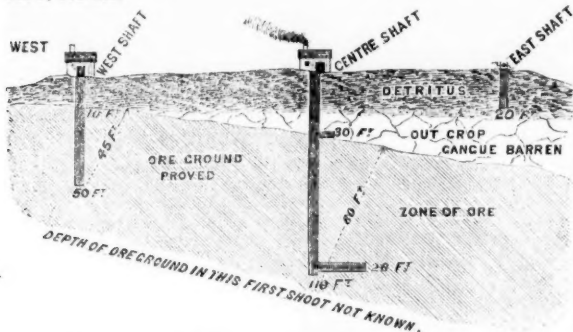
SECOND-HAND RAILS, AND EVERY DESCRIPTION OF RAILWAY, COLLIERY, AND CONTRACTORS' PLANT ALWAYS ON HAND.



## Original Correspondence.

## COLORADO SILVER MINES—CARIBOU BOULDER COUNTY.

**THE IDAHO MINE.**—On the north side of the village of Caribou, in a hill rising about 450 feet above the gulch, there is a lode bearing this name; its course at surface is N. 62° E., and dips to the north at an angle of 82°; it was discovered in 1870, and has been operated by a local company in twelve shares, on a kind of Cost-book Principle. The capital, as near as I can ascertain, is \$5000. There has been three shafts sunk, respectively 50, 110, and 20 ft. deep (see diagram). No ground has yet been stoped away, but in sinking the centre and west shafts through the first shoot of ore, with 26 ft. of level driven east from the bottom of centre shaft, 29½ fms. of ground has been removed. This has produced 44,730 tons of ore, which was sold to Messrs. Hill and Co., of the Blackhawk Smelting Works, realising \$8093.52, or \$180.70 per ton. The quantity of silver which it contained is as follows:—Lot 1, 70 ozs. per 2000-lbs. ton; lot 2, 139 ozs.; lot 3, 160 ozs.; lot 4, 231 ozs.; and lot 5, 303 ozs.



In addition to the first and second class ore, which alone constitutes the above, there is a large quantity of third and fourth class ore now ready for treatment as soon as crushing and dressing machinery is provided. The lode averages 3 ft. 6 in. wide, and is ore throughout. It consists of silver-lead, blue sulphurets, malleable and glance silver, a little black oxide and sulphure of iron, yellow sulphure, tetrahedrite and carbonates of copper, a little zinc-blende, and stainings of black oxide of manganese. Its specific gravity is 4.75, therefore weighs 295.87 lbs. per cubic foot. The solid ore, which forms the leading vein in the lode, is 3.36 in. thick, giving a little over 1½ ton per fathom. The gangue is chiefly a granular quartz, felspar, and soft grey gneiss. It is very ferruginous; specific gravity, 2.45; weight, 1531 lbs. per cubic foot. The proportion of iron to gangue may be taken as 1 to 12. The lode, therefore, gives 10.39 tons per fathom, and, according to the returns thus far made, is worth 274.35 per lineal fathom. How far this fine course of ore will hold down I cannot determine. Its dip is to the eastward, and is increasing in quality as it descends. The west shaft has gone through 45 ft. of it, and the centre shaft 80 ft.; these shafts are 125 ft. apart. There is consequently 217 fms. of ground between them. Valuing this reserve from what has been produced as a data—217 × \$274.35—its marketable value will be represented by the sum of \$59,533.95, a very pretty mineral asset for a young mine only 18½ fms. deep. The extent of the grant or claim is 1400 ft., which has been secured by a Government patent. From this only 151 ft. has yet been explored. A cross-cut adit from the valley—about 133 fms. in length—would drain this mine to a 40 fm. level, and I think pay for itself in one year, as no pumping or hoisting would then be necessary.

**Dividends:** The non-publication of true mining statistics in a plain, practical form, I think has led our English friends to think Colorado mines are not of much value. They are perfectly right in so thinking, and the apathy of our great mine owners may be attributed as the cause. I can at this time name over 50 mines in the counties of Boulder, Gilpin, and Clear Creek that have paid over cent. per cent. to their respective owners, and I know of a like number of prospective mines that before another year has passed will do likewise. But it must be understood these mines are not managed by "directors' favourites," mere boys sent out here to take charge of a mine, who never saw a mine in their lives. We want here the "thorough practical Cornish mine agent," a man who knows the value of an end, a man who will manage the financial as well as the mineral department to the advantage of his employers. In Idaho Mine we have an example of what has and can be done. From the \$5000 capital—not over at the very highest estimate—\$4000 has been expended, yet they have received in cash \$8093.52, the vouchers for which I have in my possession, signed by Prof. Hill, the gentleman who bought and paid for the ore. This is equivalent to a dividend of 200-23 per cent. upon the operating cost; and from what I have thus far seen of the mine it promises to even double this profit when carried out on a scale commensurate with its merits.

I am now engaged on a survey of the Great Caribou Mine, which has recently been sold for about \$3,000,000. It is operated by a company known as the "Mining Company of Nederland," the Hague, Holland. It is a splendid mine, and when I have completed my estimates of valuation I will furnish you a report should the proprietary desire to have it made public.

Central City, Colorado, Dec. 25. CHARLES S. RICHARDSON,  
Mining Engineer, &c.

## COLORADO MINES AS A FIELD FOR INVESTMENT.

**SIR,**—My attention has been called to a letter, signed Daniel Roberts, in the Supplement to last week's Journal, in which he animadverts very severely on the prospects of the Hall Valley Mining Company. As such statements are calculated to cause anxiety to some of our friends who may not be fully acquainted with the facts, I beg that you will insert the following in your next issue. I have just returned to this country from Hall Valley, where I have been residing since April last, and as one of the managing directors, may claim to be able to bear witness to the prospects of a company in which I and many of my personal friends are deeply interested. In *primis* Mr. Roberts's description of the property is correct; the mines are high up, the winter is severe, and the ore was never claimed to be anything but low grade. The vendors (who are also large shareholders) believed that 20 tons of 50-oz. ore was a fair production to calculate on per diem. The result of six months' work has shown this estimate to be far below the true one, since two of the lodes alone (the Whale and Leftwick) can easily produce 40 tons of 100-oz. ore by the time that the snow is off, next spring.

The captain of the Whale Mine informed me before I left that, should the lode continue only as good as it then was (it is always improving), we could engage with 40 men to take out 20 tons per day next spring, whilst the Leftwick has been opened at seven different points in as many hundred feet, and is on ore in every level. This lode is not on the ridge, but at the very foot of the peak. The lower level is in some 250 ft.; No. 2 about 150 ft., and the upper levels from 75 to 150 ft. each. As to the "unaccessibility" of these lodes, I have only to say that they are in full work now, and will continue so all the winter. By next fall the tram, which is now completed (connecting the mines with the works, which are situated 2000 ft. below, where the snow is not nearly so heavy) will be shedded over, and the ore brought from the mines to the furnaces as easily as in summer. We have miles of timber for charcoal all around us; we have water-power and abundance of iron ore for flux, and our works have been designed by thoroughly competent engineers to treat the very ore we have got. Mr. Roberts probably passed through the valley in the snowstorm, and thought it a pretty wild place; it is so. Probably both General Hall and myself were in Denver at the time, and the foremen were too busy to be communicative, otherwise I cannot understand how it is possible for a gentleman who has had some mining experience (as Mr. Roberts must have to be found as your correspondent) could have come to the

conclusion he has. No one values the opinion of practical miners more than myself, and I have conversed with many about our mines, and never till now have heard one unfavourable opinion expressed. However, for the benefit of those who put more weight, and no doubt deservedly, in the best possible professional opinion, I will transcribe a few lines from Professor Schermer's (of the Denver Mines) report, made on Sept. 15, before any of the more important developments had been made:—

"I regard the Whale, Madagascar, Leftwick, Comet, Adriatic, Cold Spring, and Tecumseh as your most promising lodes. The principal character of all these lodes is nearly the same: the ore is argilliferous, green and grey copper, and the gangue rock sulphate of baryta. Many of the lodes—the Whale, for instance, also the Cold Spring—show very strong crevices, and have now exposed large quantities of ore. Take them altogether (N.B.—25 lodes), they are above the average of discoveries in a new district. I should judge there are between 500 and 600 ft. of tunnelling, cross-cuts, and trenches dug on your lodes." Further on, and in conclusion, Professor Schermer goes on to say:—"Allow me to say that I consider you have one of the best mining camps in Colorado, plenty of timber and water, easy grade for tramways, and the most magnificent opportunities for tunnelling good, strong, and large crevices in your mines, and I can see no reason or cause why you should not meet with merited success."

Professor Stewart, of Georgetown, who certainly should know something of mines, spent a few days with us non-officially last fall, and his opinion was even more favourable. Condensed, it was to the effect that if we did not make "big money" with the mines and facilities at our command we—i.e., General Hall and myself—deserved to be shot. In this opinion we entirely agreed.

In conclusion, I would add that if Mr. Roberts will come across the range next June I shall be happy to show him at least a dozen lodes all on ore, besides the two already referred to, which together can produce more ore than we have furnace-power to handle, a tram-road doing its work perfectly and making an immense saving over teams, and furnaces that will satisfy him.

I am surprised that in speaking of our low-grade ores Mr. Roberts has omitted that which was the talk of the country when I left—i.e., the large amount of native silver being found in our lower levels, those deepest in. Assays no one has less faith in (to judge averages on) than the subscriber; but when Messrs. Johnson and Matthey here give us returns of over 2000 oz. per ton, we can fairly opine that our estimate of 50 oz. average is below the mark. I apologise for taking up so much of your space, which, however, I think in justice to this company you will allow me.

J. GLADWYN JERR,  
Cannon-street, London, Jan. 15. A Managing Director of the Company.

**P.S.**—With reference to Mr. Roberts's remarks relative to the long list of mining failures, that through want of experience, honesty, or common sense, have undoubtedly occurred in Colorado, I would add that in laying out our plans for working the Hall Valley mines, these very failures were most anxiously studied. General Hall's experience in Colorado dates back many years, mine is but recent, but I think we have much to thank our predecessor for in the way of warnings which no one in his senses would disregard.

## CAPT. FORBES, AND FLAGSTAFF, LAST CHANCE, AND TECOMA.

**SIR,**—As Captain Forbes's name has been continually alluded to in the Journal in connection with the Flagstaff, Last Chance, and Tecoma Mines, it may interest those of your readers who hold a stake in those properties to know that Capt. Forbes is now on his way home, but has been delayed by typhoid fever, at Salt Lake City. The whole of the correspondence between Capt. Forbes and the directors of the three mines will shortly be in the hands of the shareholders, and they will then be able to judge of his conduct in regard to the interests confided to his charge.—Victoria-street, Jan. 15. A. B. MITFORD.

## EMMA MINE.

**SIR,**—Seeing last week's sudden and desirable rise in the stock of this company, I readily concluded that the board and committee had at last effected the long-looked-for and much-desired discovery necessary to the return of the palmy days of monthly dividends; but on making enquiries at the office I found this information not to have arisen from or known there, the board and committee being at present only anxiously awaiting the news, which is apparently well known and discounted on the market. Remembering former occasions when the board were the last to receive and impart momentous information, I was led to look through the register, to ascertain if this masterly inactivity might in any way arise from that body having only a slender interest in the mine, and on Saturday I found that of the investigation committee, which numbered originally twelve, there remain but six, and one of these gentlemen—Colonel R. R. McCrea—holds the enormous stake of one share, which the register shows has been the limit of his interest for months. I thought it odd that a member of the committee with this petty interest in the mine should be entitled to receive and use all the telegraphic and other information so sedulously withheld from the general body of shareholders, many of whom hold one hundred times, and some one thousand times, as much.

I see Messrs. Brydges, Wiliams and Pemberton (the solicitor), who may be presumed to know most about the mine, hold just their qualification, 25. General Gardiner holds the same number; therefore each of these gentlemen have less than 100¢ at stake, yet are able, if they felt disposed, to take advantage of whatever information may reach Queen Victoria-street, if ever such should arrive there before being discounted in Capel-court.

I suggest to my brother-shareholders the advisability of calling a meeting, in order that the result of the labours of this committee, which has proved so disastrous to their number, be laid before us. I confess I should like to hear what has been effected by them; for, peradventure, the remaining six may suddenly succumb to the undue strain of their gigantic task; and as the meeting is overdue, and the Chairman for the second time is in New York with Mr. Park to arrest, if possible, his threatened attachment for the Illinois Tunnel claim, and as Mr. Atwood is called from the mine there also to assist in their deliberations, we ought certainly to have laid before us something well worth our attention. We can have no possible doubt about this when we remember the so glowing account which made our hearts glad, and raised the price of shares, on Mr. Anderson's previous journey to the mine under Mr. Park's superintendence; and should it be worth while to repeat the sensation, we may expect as encouraging a specimen of their inventive genius as that with which we then were favoured.

Perhaps it may be well for the shareholders to know that Mr. Orr Ewing has ceased to be a shareholder, and that Mr. Clavering holds a very small stake, also that there are a host of black mailers holding back till this Tunnel claim is disposed of, ready to pounce down upon the poor cleaned out and caved in live as soon as they see the least chance of scraping from it any honey, or even wax if such remain.

## NORTH AMERICA GOLD MINING COMPANY.

**SIR,**—Our directors have issued their annual report and accounts, also Mr. McLean's recent report on the mine to the shareholders, and the meeting has been held. They state in their report that the accounts are "to Nov. 30, 1873." This may be true of the accounts of the London office, but it is not true of the far more important ones of the mine, which are brought up to Aug. 31 only. Our directors know best why they suppressed this fact, and informed the shareholders that the accounts submitted to them were all made up "to Nov. 30, 1873," and that the loss on the total transactions of the company since its formation up to that date was about 1132¢. The labour account alone for September, October, and November, 1873, was, our Chairman informed us, 7000¢, or 8000¢, and from this we get some idea of what the loss would be had the total costs at the mine for the same three months of 1873 been included in the present balance sheet; and as the working capital of 10,000¢ has already been spent, the heavy addition to the alleged loss of 1132¢ will have to be met from the profit, if any, of this season's washing, and the shareholders will again have to go without any dividend, if, indeed, the mine itself be not sold to pay off this debt.

Our directors assure us that "Mr. McLean appears to have full confidence in the future value of the property." The words in his report are—"I see nothing discouraging in the present aspect of North America"—a negative, half-hearted form of expression, which seems rather to damn the property with faint praise than to imply full confidence in it; and how could he, however well inclined for his own credit to do so, express any real confidence in a property which at the end of two years' working is justly described by a shrewd and well-informed correspondent, in a letter dated San Francisco, Nov. 20 last, to the *Mining Journal*, in these terms, "I say nothing about the value of the Blue Tent property, but Mr. McLean inspected for the North America Gold Mining Company, and strongly recommended it, and which so far has proved an entire failure."

When, in 1871, there was question of the purchase of the property and of its value, and Mr. McLean inspected it for our directors, there was then no want of

water to test the quality of the gravel, which he found to be "rich, giving \$3-3¢ to the barrel." Now, "the entire absence of water," Mr. McLean says, "prevented him from making any actual test of the gravel in the dump yard," and so determining whether it was richer or poorer than when we examined it two years previously, it then prospected exceedingly well, with a pan yielding 50 cents to two pans of dirt." Moreover, we read in Mr. McLean's report of 1871 (on which the property was bought) of "living springs, which if thrown into the aqueduct would add a 14 inch to the water supply;" and in Mr. Morgan's original report of "a reservoir, where 100 carloads may be protected daily, water for the purpose being available at all times." Granting, however, that the living springs and the unfailing reservoir had become dry, and that Mr. McLean could not even procure enough of water to prospect the gravel in the dump with a pan, he could at least have stated in his report the actual result of last season's washing of 60,000 or 70,000 carloads by Mr. Morgan; much of it, according to the report of the latter, "of a heavier sort of gravel than any ever before met with in this or any other mine in the neighbourhood," and all of it "of an excellent quality." That gentleman could have told us whether it yielded \$3 to \$5 per carload, as testified to by Mr. McLean, or \$3½, as reported by our Chairman, or \$3-3¢, as proved by Mr. McLean himself, or one-half, or even one-third, of the least of these quantities. On this important point our directors, although, of course, perfectly well informed, had kept us completely in the dark, and it was, therefore, all the more incumbent on Mr. McLean, whom we had paid 100¢ for his report, to enlighten us, although by doing so he might have damaged more than his own reputation, for, according to Mr. Peehey, who is a recognised authority on the subject, "no man who has ever worked in a hydraulic mine can possibly be deceived in estimating its value, if he does it honestly."

As a reason for the non payment of the often promised "handsome dividends," our directors in their printed circulars, dated Sept. 5 last, alleged the scarcity of water to wash the gravel taken out of the mine; to this plea Mr. McLean's recent report gives no countenance whatever, and that it was perfectly groundless is evident from the extract of Mr. Morgan's letter of Nov. 8 last, quoted in their report, that only "about 8000 carloads of gravel remained in yard at close of last water season," so that with the season's supply of water (and that an exceptionally scanty one) Mr. Morgan, as stated in his last letter to the Journal, washed nearly the whole of the gravel (some 70,000 carloads) taken out of the mine in two years by his own most vigorous operations.

As no report of our directors would be complete that did not proclaim the virtues of Mr. Morgan, they refer to him in their present one thus—"Mr. McLean's report seems to confirm the confidence of the directors in the character of the superintendent." Evidently, they are not quite sure that it does, but it seems to them to do so, and if any higher qualities are required in a superintendent than to be active, able, and to have placed the mine in a condition unsurpassed for rapid working at small costs, no trace of them in relation to Mr. Morgan will be found in Mr. McLean's report. He could not forget that previous to the sale of the mine to this company Mr. Morgan had worked in it as joint proprietor for years, and I could not possibly be mistaken about the quality of the gravel in it that he had confidently promised us if the management were entrusted to him, 55,000¢, to 60,000¢, a year in dividends; that instead of this he had paid us nothing whatever, but spent the entire working capital of 10,000¢, on the very little dead work to be done in these mines (see Mr. Morgan's letter, Dec. 26, 1870), and ran up a debt of several thousand pounds against the mine; yet this is the man whom our directors in their reports, independent shareholders at the mine (embryo Chairman and directors), a disinterested correspondent of San Francisco newspapers, invariably describe as the able, excellent, model manager; but they do not attempt to explain to us by what process the gravel which Mr. Morgan, Dr. Degroot, and others, described as very rich, has turned out to be so very poor; the water that was so abundant became so very scarce, and the magnificent dividends transformed into a heavy debt on the mine. Was it the competency of Mr. Morgan and the others that was at fault in bringing about this deplorable state of things, or their honesty? Our directors do not say, but I recommend the shareholders to await patiently the result of another season's operations. This recommendation may very well suit the vendors, promoters, and others, who have pocketed some 50,000¢, or 60,000¢, of our money, but to us it seems to us like the cry of despair, and the ultimate loss in this concern of our entire capital. And it can hardly be a pleasing reflection even to those who have contributed to this result, that their victims are not the rich, but in many of them poor men and women, to whom the loss of 200¢, or 300¢, is a serious matter, and the privation of the comforts and even the necessities of their position in life.

A SHAREHOLDER IN NORTH AMERICA.

## QUARRY HOUSE MINE, NORTHUMBERLAND.

**SIR,**—In the abridged prospectus in last week's Journal it is stated that this mine is situated "in a locality which is well known to be exceedingly rich in deposits of lead ore. Vast fortunes have, in fact, been realised in this neighbourhood, and in the working of lead mines." I should be glad to be informed what "locality and neighbourhood" are referred to, for I think no working lead mines exist within a less distance than 10 or 12 miles. I should also like to know what quantity of lead ore in the aggregate has ever been sold from Quarry House Mine, and at what profit? If the engines and machinery which Mr. Fairless put down at this mine are still on the premises, they are more than ample for all purposes if only properly applied when Quarry House or Barington Mine has to be re-opened. It would interest many parties in this part of the country to be informed of the history of this mine.

Haydon Bridge, Jan. 13.

C. D. DODSWORTH,  
Mining Engineer.

## NANT-Y-GLO AND BLAINA IRONWORKS COMPANY.

**SIR,**—The worst is now known with regard to this ill-starred concern. The old directors have finally retired from office, and five new directors reign in their stead. Care appears to have been taken in the selection of five competent gentlemen, and whatever can be done to retrieve the fortunes of the undertaking will, in all probability, now be done. What is wanted is clearly a more minute supervision of the details of the company's business, a surveillance of those details by gentlemen of practical experience, and a reduction as far as possible in working expenses. At an adjourned meeting of shareholders last week Mr. Hugh Mason, the chairman, reflected in severe language upon some of the late directors. Time will show whether the language was justified; meanwhile, it is rather doubtful whether it was particularly useful to employ it. The old directors had been got rid of, power had been obtained by Mr. Mason and his colleagues, and it is a question whether it was wise to employ language which may have the effect of creating future discord in a concern in which present harmony is essential to future success. But what we confess is to our mind inexplicable about the Nant-y-Glo and Blaina undertaking is to hear it described by Mr. Mason in one breath as a "fine property," while in the next breath we find him stating that losses have been going on since the last accounts were made up—that is, since Aug. 31, 1873. The management of the "fine property" so called, must have been bad indeed if, with the possession of substantial natural resources, the company has been allowed to go on not only realising no profit, but actually making a loss month after month, and that in a year when other concerns, such as Bolekew and Vaughan (Limited), have made excellent profits. The great point evidently to which the new board of directors will have to direct their attention is the stoppage of losses, at any rate. It is true that the iron trade has had to face during the last few months very grave labour difficulties, but the Rhyimey Company found a compensation for these labour difficulties in the advantageous outlet which it obtained last year for its coal; and why did not the Nant-y-Glo Company pursue a policy analogous to that adopted by the Rhyimey? The answer, we fear, can only be that the details of the Nant-y-Glo business were not looked after so carefully from day to day as those of the Rhyimey. It is satisfactory to hear Mr. Mason stating that pressure was brought to bear upon the old board during the past few weeks to increase the price of coal, although it is unsatisfactory to find that the sales effected and the profits realised under this head have been comparatively trifling. But why, again, should it have been necessary to bring pressure, as Mr. Mason states, upon the old board to increase the sale of coal by the company? Were not the advantages of such a policy obvious enough without its being necessary to bring pressure upon the directors to enforce them? And has there been no real management directing the affairs of the Nant-y-Glo and Blaina Company during the last six or eight months? The answer would appear to be in the negative; the company would seem to have been left very much to shift for itself, and to have been allowed to drift helplessly on to ruin.

There is one satisfactory feature about the new board; they are men of business, and not mere titled personages like Lord Henry Gordon Lennox, who appears to have not attended a single board meeting for three months together. It is also satisfactory to find that the new directors are on economical thoughts intent; that they see that there is great room for retrenchment, and that the present expensive offices of the company are to be dispensed with. The new board will probably sit in Manchester or some other place in the North of England, or even at the works themselves. At any rate, it seems tolerably clearly established that a great Welsh iron company cannot be conducted satisfactorily amid the whirl of London society, and by gentlemen who are engrossed by the House of Commons or the world of fashion half the night. But while it is satisfactory to find that sound ideas as to management are beginning to assert their due influence in connection with the Nant-y-Glo and Blaina Ironworks, it is unsatisfactory of course to find that another unprofitable half-year has slipped away, and that there is not the slightest prospect of an interim dividend being forth-



coming for the proprietors, as it ought to be forthcoming, in March or April. However, we must give the new directors at least six months trial before we can really make up our minds as to the actual value of the Nant-y-Glo and Blaena property. For our part we are inclined to regard its future hopefully now that practical experience and North of England energy have been brought to bear upon the concern. Before quitting the at present lugubrious Nant-y-Glo and Blaena topic, we may add that the experience so dearly purchased by the company appears to have been turned to profitable account in Yorkshire. The closing of the Nant-y-Glo Works because iron could no longer be produced at them at a profit, has not passed unnoticed in the world of labour; and at Sheffield John Brown and Co. (Limited) and Charles Cammell and Co. (Limited) have succeeded in establishing a reduction of  $7\frac{1}{2}$  per cent. in wages.

SHAREHOLDER.

#### N. ENNOR ON PRACTICAL MINING.

SIR,—In my last I was describing the Cornish mine practicals: I have finished with the lazy class. I next take the second class, called honest men. I have no doubt they are so to a certain extent. They are men who may be set down as honest, but they are slow-going coaches, commonly called the quiet and easy; often dissenting preachers, ever active in detaining a man from his work for hours together, if they think they can preach a sermon to bring him over to their creed, or way of thinking. However honest their intentions may be, a portion of them are said to close their eyes when the man they have converted to their creed, after he is put into some situation, manages to throw the tin into the river.

We are told that "There is a time for all things;" then, the time for working on the mines is all the usual hours, and no preaching on the mine. Every man who works on a mine should be honest, and do a shilling's worth of work for a shilling; otherwise mining in Cornwall is bound to collapse. I will next call the attention of Cornishmen to the progress made within the last half-century in almost every branch of business. The motto is to vie with each other, and to go ahead. See what every trade and manufacturing business has done by way of making progress. Then look at the electric telegraph, the gas-light, and the railways; even the agriculturists have made rapid strides; but when I turn to the Cornish miners and engineers I may fairly ask if they have not retrograded, if taken as a whole?

In the former half-century we had self-taught engineers—men of inventive genius, men who have produced engines that were celebrated throughout the world. Where are these men now? Turn to the mining classes: the two western counties had then about 100 men who found mines that paid outlay and interest on money, and thousands of pounds into the shareholders' pockets. Then, how are we to account for the present dilemma, when the two counties cannot produce ten men who have found mines of this description? This should be accounted for in some way. Is it negligence on part of the miner, or are all the good mines found? It may be that the majority of the class that should have been the active and go-ahead men have not kept pace with all the rest of England; or it may be that they have more regard for their future than the go-aheads of other trades, and have turned dissenting preachers.

I never knew a railway ganger to preach anything to his men but "go-ahead;" he is employed expressly for that purpose. I remember once surveying a mine near Camborne. On the following morning, when about to leave, I passed the captain's house. I had left a paper with him containing some remarks. I called for it, expecting he had gone to the mine hours before. I knocked, a girl came out, and said that her master was engaged in family prayer. I requested her to tell him that his place was at the mine hours before. He did not make his appearance to me. I often find those men expert in shareholding. I have not the least objection to their looking, to the future, but they are bound to be at the mine at proper hours, to keep the men at work, otherwise they have their hand in the adventurers' pocket.

I next turn to the present mine captains. What are they doing? Surely they do not turn all their attention to preaching. I said before there is a time for preaching, but diligent work has been the motto from the foundation of the world. I say honest work is religion. I do not say that throwing away the adventurers' tin is, but I do say that religion is useless to those who are not honest in every act and deed, even in their daily labour. It is the duty of every man to be honest and steady. It provides labour and food for the millions. I noticed the remarks of "A Shareholder," last week, where he says he has applied to see the books of a certain mine he holds shares in, but the purser will not show a single book, or explain the accounts to him. This, to me, is monstrous. How long will mining stand under such a system? It is not unlikely that this very mine is in the hands of dissenting preachers. Then, it is said that few of them look to the interest of the shareholders. Be this as it may, I have ever found them to be selfish.

Men to keep up Cornish mining must be full of thought and inventive genius. These and preaching are not easily combined in the same man. I will say no more on this now, as I think very little of them as mine redeemers. See the present mining dilemma; it tells its own tale, and proves that I am not far wrong. Active go-ahead men are wanted in Cornish mining, men who keep pace with the age. Cornishmen appear to have lagged behind for the last 20 years. I believe there are still men of the right stamp among the community to keep pace with the age. I know the majority of this class are good practicals, men that can throw down the gauntlet against all professors and school-taughts in the world, as their mining knowledge is not recent. Many of them are men who have had some 40 years good practice in the earth. They have read their own natural book, and should have learned a large portion of the laws by heart. They should have done more than that—have learned self-confidence, sufficient to say that no man in any part of the world could master them, as there is not a single book-taught man to be found who ever spent one-fourth of his time in the earth. Then, how could he possibly know what they knew? He need not fear them on account of their grammatical language. One of his known facts, in his own language, will upset all the vague theories they ever learned from all the books they read. He must know that but few of them ever wrote books from practical knowledge, acquired by themselves in the earth's interior. They only write from what they gather from books, and what practicals tell them. If they come to argument with a good practical they are done up. These are not the men who should survey and report on mines. All mine surveyors should be go-aheads; men that watch and learn Nature's laws, and only preach to their men "Go ahead, and keep pace with the age;" men who watch and learn Nature's laws, and say openly "We Cornishmen will keep our ground against all who come." This should be their motto, but I fear even this class have retrograded, or I may say have not kept pace with the age, as I think they should have come out stronger in the finding of good mines. In former times their name was legion, now it appears they have left it all to loafers—the class that have disgraced Cornwall under the appellation of anonymous. This may appear strange, but it is true. Our first-class practicals do not come out in the light they should. I know many who have tried their hands at home, and have failed; and I know many who have emigrated, but I find few who have returned with a name and fame that should aid the Cornish miner. Many have gone of late to California, but they did nothing there, though that country has recently produced some first-class mines. Then, what have our would-be experts done, they claiming to be first-class practicals? They go over sword in hand, and who to meet? Why, only the few greenhorns and professors, men of no earthly experience. To my great surprise, these would-be experts all got "licked." They allowed all the English shareholders to be bitten by the Yankee reporters; they found not a single paying mine, or made fortunes for themselves. This has taken me by surprise. Though I knew that these men were pitted against Yankees, men who have earned the name of go-aheads, and emptied the English adventurers' pockets; they sent the Cornish practical home with no better appearance than a run-away dog, with his tail between his legs. Had they good practical knowledge of mining they would have taken the lead, and not have allowed not only the book-taughts to weed Englishmen's pockets, but even the go-aheads,

who never knew either theory or practice. What can these men do at home if they cannot find a paying mine? To me it seems that they are about to argue that all the paying mines are found. Then, it is useless for them to go to Wales, Australia, or America. Surely good mines are to be found there if none are left at home.

Wadebridge, Jan. 13.

N. ENNOR.

#### MR. ENNOR, AND NATURE'S LAWS.

SIR,—Some months ago, having perused Mr. Ennor's "practical" letters, in which he often spoke of "Nature's laws" and "Freaks of Nature," I requested that he would be good enough to separate the laws from the freaks, that I might pursue mining according to the skill which he professes to have in that science or pursuit. He has not vouchsafed a reply to my request. In last week's Journal he has given an article on "practical mining," in which he lashes the theoretical men pretty lavishly. He says that "a man to be a practical must go into the earth, and work a portion of his time. To know mining he must work and observe Nature's 'freaks,' and learn a portion of the golden laws." He speaks of "Nature's beautiful book," "the interior laws of the earth." "Young men," says he, "should make themselves masters of these things, and a hundred other subjects on Nature's freaks that they discover in the interior of the earth." "Earth's own laws." "Employ your time by hard work in the earth, your natural book." "The best site to gain knowledge is in the earth." "These men (speaking of an idle class) never study a single law of Nature; they never attempt to open a leaf of that book—a book that contains only golden rules."

What I want Mr. Ennor to explain is the difference between the "laws" and the "freaks" of Nature. If Nature's laws are freakish (like some girls) a serious lover of them is liable to be jilted, unless the freaks can be made subject to some known rules, and then they would cease to be freaks. I infer from Mr. Ennor's use of the word "freak" that all the laws of Nature which govern the distribution of metals, &c. in the earth are not known. He pretends to be a great teacher—an oracle—in mining matters; but I apprehend that self-appreciation exceeds that accorded to him by the mining public.

Jan. 12.

R. S.

#### MINERS' CONVERSATIONS—No. XII.

Bill.—Do you know anything of the Roche district of mines?  
John.—I never worked in that parish or its neighbourhood, but I saw a few weeks ago a miner who worked at a mine called Brynn, where Capt. Martin Rickard is the agent. He gave all particulars of the district. Capt. Rickard has not been there many months, before him Capt. Thomas Parkyn was the agent there. A Mr. Wright, of London, was the chief adventurer till a few months ago, when the mine was taken in hand by a company, formed, I believe, of Londoners. They call it a mine, but I am informed that it is chiefly an open work on an elvan course, containing a small percentage of tin ore, scarcely sufficient to pay, but there are lodes in the sett which have not been tried. There is also, I believe, an iron lode in the sett not much proved. While Capt. Parkyn was the manager he represented the mine, in his weekly or other reports, as the most promising of "concerns," but now that he has left the mine he speaks, I hear, very differently concerning it.

Bill.—What other mines are there in that locality?  
John.—Brynn Royalton Mine adjoins Brynn, having the same elvan course, and several tin lodes slightly worked. On this mine, as well as on Brynn, a steam stamping-engine was erected, but did not work many months. Capt. Parkyn was manager here also. I do not know whether anything is being done there at present. Roche Consols is another sett in the district lately under Captain Parkyn's management, having a stamping-engine now also idle, I believe. Great Brynn Royalton is another mine set to work by Capt. Parkyn's party, but abandoned under the same circumstances as the other mines. Castle-an-Dinas, formerly called Great Royalton, is another of Capt. Parkyn's mines. All these mines have the Brynn elvan course, but in this mine the quality of the stone is better for tin than in the other mines. This mine is also idle, and the machinery is for sale under mortgage powers. Tregoss Moor is said to be a kindly mine, also under Capt. Parkyn's management. Wheel Mary is another of Capt. Parkyn's boasted discoveries. It is described as being rich in tin, but as the tin is very shallow some people doubt whether it will last in depth. Time will show. There are several mines between Roche village and St. Austell, which were set to work by companies formed by Capt. Cock, of that village. Their names are, or were—the Beau Mine, formerly worked by Messrs. Williams and Co. for tin; Cornubia, formerly worked by Mr. W. H. Gray's party; North Bonny Mine, worked shallow by the ancients; and one or two others whose names I have forgotten. There is also a mine called Bonny or Shelton, nearer St. Austell (tin), now, I believe, idle. How Capt. Cock's mines now stand I know not. Beau Mine was rich in former times; all the others (except Cornubia) have been only slightly worked.

Bill.—From what you have said I do not look upon the Roche district as particularly eligible to invest in.

John.—I said that, with two exceptions, it had been only slightly developed. What further trials may show as to its value remain to be seen after such trials have been made. The district is valuable as productive of china-clay and china-stone in immense quantities. A system of railways is in course of construction, which will enhance every species of property in the district, and stimulate the industries applicable to the same.

Bill.—Do you know much of St. Stephens, near St. Austell, as a district?

John.—Yes; because I worked there under Mr. J. Harris-James, who is the managing director of Portescue and South Teras Tin and Iron Mines. I found him to be a clever man, and very fair in all his conduct to the men, as well as to the companies. He sprung from one of the most ancient and respectable families in the county, whose arms he bears. It is said that he is entitled by deeds to a very large property in Cornwall, but because of the time that the lands have been held by adverse possessors—owing to circumstances that I cannot detail—it is feared that his chance of recovery thereof is small.

Bill.—What is your opinion of Fortescue Mine?

John.—Very good; there is abundance of tin there, which they are now returning. They have had many hindrances, otherwise the first sale would have been much earlier. I believe the first sale will be this week. A man called Derry served the company badly by filing a petition in the Stannaries Court. In consequence of that bad act he will, doubtless, be a marked man for a long while to come. South Teras is more an iron than a tin mine. The iron is the best in the county, and the reserves are practically unlimited. Teras Mine is a work on an elvan course, containing tin in paying quantity when the price is high—not otherwise. It is at work now under a London company. There is a steam-stamp at work. Wheel Blencowe is adjoining Teras, also a tin mine on lodes. The works here have been carried on with great spirit, and I hope that success will crown the efforts of the company and the agents. Capt. Edwards, the manager, is a first-class agent. He was the manager of Great Wheel Busy during the former working, and he told me that Wheel Busy ought not to have been stopped. The London secretary did the mischief. There is a lead mine in the neighbourhood called New Crow Hill, where the shareholders have shown remarkable patience in continuing the work under continued losses. I have little hope for a much longer existence for this mine. The most singular instance of a mine's brevity was in that of the Bodinnick Iron Mine. The company took the lease, having scarcely proved the quality of the ore. They then constructed a railway to connect the mine with the Cornwall line. Soon after they did this they found that the quality of the ore would not do for the market—hence abandonment. The works I hear were mortgaged. Very likely the South Teras Company will purchase the railway for the conveyance of their ore and materials. Half-a-mile addition to it will connect their mine with the Cornwall Railway. A mine formerly called Dowgas, or Great Dowgas, now called the St. Stephen's Mine, adjoins Portescue and Hewas Mines. It is being set to work by an out-county company, under the management of Capt. John Nicholls, of Truro, a good miner of considerable experience. There are also several other small mines in St. Stephen's parish, including lodes of iron as well

as of tin. St. Austell Consols is, I believe, included in the St. Stephen's Mine, and is singular from the fact of its containing every kind of mineral raised in Cornwall.

St. Just, Jan. 12.

AGENT.

#### ON OPENING MINES FROM SURFACE.

SIR,—A Miner, whose letter under the above title is contained in last week's Journal, appears desirous of eliciting the opinions of miners on this subject. He advocates the sinking on the "course of the lode"—diagonally in nearly all cases, instead of having perpendicular shafts, to strike the lode at given depths. I have had a great deal to do with mines during a long life, and therefore ought to be qualified to give an opinion on this subject. My opinion is this—in new mines, or in commencing a mine, sink on the lode, in order to ascertain its metallic character. If you find it good for about 30 fms. deep, and of a character to justify the expectation of its continuing good, sink a shaft north or south, or east or west (as the case may be), of the trial shaft to intersect the lode at a convenient depth—say, 80 or 100 fms. from surface. This should be the engine and win shaft. During its progress cross-cuts to the lode should be made at every 10 fms., as is usual, so that the ores may be drawn up through that shaft. My principal objection to the use of a diagonal shaft on the lode is this—scarcely any lodes that I know dip in straight lines; the underlie varies in nearly every one. I know a shaft on a lode that in some places is perpendicular, in others underlying northward, and in others southward, so that to place pumping-rods, &c., in such a shaft would obviously be very inconvenient and expensive, and difficult to keep in order. Besides, to draw through such a shaft would also be attended with frequent lets and loss. As a rule, therefore, I contend that perpendicular shafts should be preferred to those of the incline kind when a mine is to be fairly worked. The intelligent managers in the central district of Cornwall have adopted the perpendicular shafts in most cases.—Jan. 12.

R. S.

#### OPENING MINES FROM SURFACE.

SIR,—This subject, as brought before us in the Supplement to the Journal of last week by a miner, is well worthy the consideration of mine agents and miners in general. For it is certain that the Cornish plan he refers to of sinking vertical shafts to take the lode at (say) 100 fms. from surface, and then sinking on the course of the lode, is a very expensive and, in many cases, ruinous one. I shall be prepared to give examples to illustrate this if necessary at any future time. If the underlie of the lode is regular, or so nearly so as to admit of the shaft being straightened so that rails may be laid for a skip to run upon in hoisting the stuff, and good sized pulleys or rolls for main-rods to travel upon, the best plan by far would be to sink the shaft on the lode from surface. Certainly there may be more water to contend with below the adit in many cases than in the vertical shaft until the vertical shaft takes the lode. But the fact that the vertical shaft makes no trial of the lode, neither do the cross-cuts, makes it the most expensive. I don't care so much which plan is adopted, but let us try to have straight shafts.—Minsterley, Salop.

A MINER.

#### EAST CORNWALL AND DEVON STARS.

SIR,—Last week you gave us through the Journal a list of mines managed in the eastern district by two agents, and it was stated as no uncommon thing for the managers to see their mines but once a month only—on payday. Therefore it is no wonder to those residing near the mines that vast sums are quietly drained from the shareholders' pockets, and pass to the pockets of such magnets as the Inspector General. In the whole list furnished by "Lex" there is one mine paying its cost? Echo answers—No, not one. Alas! poor shareholders. I agree with Mr. Barnard that every ton of tin from such mines costs over 170l. per ton, and in many of those mines a fathom of ground costs over 50l. in opening, when you add what agencies, cost of coal, and the like, with only 5 or 6 fathoms of ground opened in a month against a heavy monthly cost. But little short of one million sterling has been swallowed up in capital and ores from a few of those schemes. When will the shareholders take warning and consult or abide by Mr. Ennor's advice—get your ore, if any, from adit levels and shallow workings? No; this won't do, for the captains who have a stake in the iron foundry, or deal in second-hand engines and old boilers, must find pits to drop pumps into and a good surface site for any old rattletrap engine. This and agencies will absorb all the limited subscribed capital, so that there is but little money available to open ground. The cost must be kept within the margin of machinery and agencies, with here and there half-a-dozen twotwork men. How is it possible to make a mine in this way?

According to accounts issued Crelake has absorbed in capital and sales of ore nearly 250,000l., paid no dividends, and is now idle. Birch Tor and Vitrifer have absorbed upwards of 200,000l., with a return of two small dividends of about 15l. per share, and are now abandoned, except old arches of ground and Italian heaps. Clugford Tinworks—capital all lost, with little or no returns, and it is reported as abandoned. Also Devon Copper, 100,000l., to fork out an old mine and let it fill again more quickly with water—no returns; although reported rich in tin, "where is it?" West Maria and Fortescue has swallowed up nearly 100,000l., with sales of ore for over 12 years, steam stamping machinery and I know not what always set up, reported rich, always making calls, no profits or returns to adventurers. In some of those mines we have as many agents, subagents, deputies, &c., as we have workmen. Alas! poor shareholders. Clitters above the adit paid by the able Captains Phillips and Seacombe good profits with no machinery; then a change of management. Again the cry—Engines for sale, and a place for engines. Up they go; 10,000l. or 12,000l. called up to fortify the hill side and face. Great Devon Consols: this mine, rich in ore and rich in calls, together with sales of ore amounting to the handsome sum of 180,000l. to 200,000l. Crebore, reported with its 10 or 12 tons of ore per fathom, going on for the second year, manager to have lost 350l. worth of ore per quarter. Can this be possible after an outlay of 60,000l. to 70,000l.? But there, as Mr. Barnard says, You must bear in mind that some captains are ravenously at the mine except on payday, so we go on to the new year. What is Mr. Law about that he does not see to this fearful waste of money and correct such abuses promptly?—Gunnislake, Jan. 8.

[We are informed that the statement of "Lex" as to the number of mines under the management of Capt. Goldsworthy and Skeewis is incorrect; indeed, Captain Goldsworthy assures us that so far as he is concerned it is altogether wrong.]

#### CORNISH MINE MANAGEMENT.

SIR,—"Lex" endeavours to be very severe upon "two of our eastern magnates, Captain John Goldsworthy and Captain Skeewis," when "Shareholder" in four of the mines mentioned happily comes forward holding in his palm the credentials of these mining captains, not merely hinting, but stating that "they having obtained a reputation by their skill, diligence, and trustworthiness, have justly earned the reward they are now reaping." Now, this cannot be designated "bunkum," it is nothing more nor less than "rot." The two noted mining representatives have my warmest regards and best wishes; but, having taken up the cudgel on behalf of the mineral wealth of Cornwall and Devon, I intend to spare the personal feelings of no one. Facts and figures, again. Surely there cannot be much "skill" required in losing thousands upon thousands of pounds of somebody's money every year of their natural life; and such is the only success, it appears, that these two mining celebrities have ever achieved. We will admit that there is extraordinary "skill" in obtaining money to prosecute mines by the dozen year after year with a ruinous loss; and if I have misunderstood "Shareholder" in the technical meaning of the word "skill" I beg to apologise, sorry I spoke, &c.; but, out of compassion for the poor fluttering moths who are formed by Nature to singe their wings, surely for humanity's sake it is high time that someone extinguished the flame which draws them to their own destruction. The properties enumerated by "Lex" are Wheal Crebore, the Gem, Deer Park, Wheal Roberts, Tamar Valley, Wheal Lucky, Menacote, Monkston, Bewdon Hill, New Crowdale, West Maria and Fortescue, Gunnislake (Clitters), South Kit Hill, Dunsley Wheal Phoenix, South Roskear, Drake Walls, Birch Tor and Vitrifer, and White Works, and what are they worth? Does even a solitary one pay costs? No; and we have, as a summary, that year after year passes by, and such men are landed for their "skill," when each and every mine they handle shows its loss whenever accounts are made up to the tune of hundreds or thousands of pounds, in accordance with the magnitude of the flame, which is governed by a favourable breeze brought to play upon it, and then woe betide the poor moths!

I am more than convinced that Capt. John Goldsworthy and Captain Skeewis do their best to win the success which they win not, and under their management if merchantable mineral existed it would soon be in the market. They are, without the question of a doubt, thorough practical miners, and do their very utmost to obtain profits and wealth for all the shareholders of the mines with which they are associated; but let us have no more foolish nonsensical (which jars upon the sensitive ears of actors behind the scenes) about the "skill and reputation" of men who have devoted a lifetime to mining, and have never yet had one single prize. They know even better than I do that the "skill and reputation" have been the unwitting breaking up of many a bright and happy home, and the revised and corrected appellation should be misfortune and ruin. Such is mining. Very few journals espousing the cause would publish these remarks, but the *Mining Journal*, with all its faults—and it has a few—is the very essence of impartiality, and always encourages candour. Fancy a correspondent speaking of the "skill and reputation" of Barnard! As a comic offering it would be a glorious joke; but I have only made two or three blunders, and am doing all in my power to rectify them; whereas it is very easy to mention the names of dozens of our noted mining men who have had to do with hundreds of mines with nothing to back their "skill and reputation" but one everlasting series of failures. More!—the whole of these mines can boast of well defined lodes representing together millions upon millions of ounces of silver, independent of low-class unmerchantable copper, and other minerals which readily admit of concentration at the hands of chemistry instead of "skill and reputation;" and, when facts and figures show that the poor innocent moths actually increase and multiply to a prolific extent in the face of having only to see a flame to know that death is imminent with more or less prolonged sufferings, it requires no assistance from an imaginative mind or pen to herald



forth the fact that mining must be redolent with peculiar "slogging," fascinating, enticing charms, and that with the flickering of the flame or speculation removed, unlimited capital will be more than willing to worship at its shrine.

Abbey Mount, Tiviotock, Jan. 14.

THOMAS J. BARNARD.

### MINING, PRESENT AND FUTURE.

SIR,—I have read Mr. Barnard's letters, and see he has faithfully kept his promise, by giving, in last week's Journal, the result of a month's trial of his system at Wheal Barnard. Although I have an unpleasant remembrance of the Berdan and other failures, I have reasons for thinking Mr. Barnard has succeeded where others failed; however, as Devon is not in Colorado, there should be no difficulty in the most sceptical being convinced of his success or failure. As Wheal Crebor is one of the mines named, the ores of which contain 6 ozs. of silver per ton, and as Wheal Crebor is in close proximity to Wheal Barnard, I would suggest to the directors and shareholders in Wheal Crebor to have a few tons of their ores treated by Mr. Barnard's process. Time is money, and as Wheal Crebor is now making a profit let them be first in the field, and if the result is satisfactory I am sure that the shareholders will deal liberally with the patentee. Such is the opinion of a shareholder in Crebor.—Jan. 11.

A. S. Y.

### EAST LOVELL, AND ITS MANAGEMENT.

SIR,—As it would have been inconvenient to attend the meeting in Cornwall, I request your permission to make the following remarks:—The statement of accounts sent by the purser to the shareholders is simply an insult to their common sense. There is a slight improvement upon former ones; in the last the costs being charged up to Dec. 6—eight months—but still we are quite in the dark. For instance, here is in close proximity to Wheal Barnard, I would suggest to the directors and shareholders in Wheal Crebor to have a few tons of their ores treated by Mr. Barnard's process. Time is money, and as Wheal Crebor is now making a profit let them be first in the field, and if the result is satisfactory I am sure that the shareholders will deal liberally with the patentee. Such is the opinion of a shareholder in Crebor.—Jan. 11.

I fully agree with the temperate letter in last week's Journal, signed by a "Holder of 25 Shares." If half the total number of shares are held by those who are not West Countrymen, then, in fairness, every other meeting ought to be in London. If only one-eighth, then one meeting in eight, &c. The course for the dissatisfied shareholders is plain. If they are sufficiently numerous, a requisition ought to be sent to the purser desiring him to summon a special meeting to be held in London (say) in a month's time. The purser and agents seem to be of opinion that the mine is "their property." Perhaps it is not to be wondered at, since they see so little of the shareholders in the out-of-the-way place where the meetings are held. For months past there has been a splendid lode in the mine, worth about 3 tons of tin per fathom, but the profits go anywhere but into the pockets of the shareholders; we have instead to pay calls.

Leamington, Jan. 12.

A SHAREHOLDER IN TWENTY MINES.

### WHEAL MARY, WHEAL TREGOSS, AND ST. DENNIS CONSOLS.

SIR,—I notice in the Journal of Saturday last a letter from Mr. W. J. Thompson, having reference to the negligence of Mr. Parkyn with reference to these mines. The thanks of the shareholders are due to Mr. Thompson for the upright and conscientious attitude he has so justifiably assumed. It is indeed time Mr. Parkyn did something more for the shareholders than draw his large and unearned remuneration. What have the shareholders not been promised? What have they received after their confidence in his inflated reports? Let Mr. Thompson continue the good work he has so praiseworthy begun, and if needs be call a meeting of the shareholders to sanction the adoption of such measures as may be deemed necessary to bring Mr. Parkyn and his colleagues before a proper authority, to answer for non-fulfilment of contract for money received. Then let Mr. Thompson put the right man (of which many are to be found) in the right place, and the shareholders will have their reward in due time. I am sure the shareholders will to a man accord him their hearty support.

Kennington, Jan. 10.

ONE OF THE SUFFERERS.

### WHEAL MARY, WHEAL TREGOSS, AND ST. DENNIS CONSOLS.

SIR,—I observe that Mr. Thompson states in his letter in last week's Journal, that no reports had been sent him respecting Wheal Mary, Wheal Tregoss, and St. Dennis Consols. My report sent to him to-day will explain why the reports in Wheal Tregoss have been delayed a few weeks. The Wheal Mary and St. Dennis Consols reports have been regularly sent to him, with the exception of last week and once when I was in London; and this day fortnight I sent Mr. Thompson Wheal Mary report, which, however, did not appear in the Journal, and I do not think that I should be charged with not sending it. Mr. Thompson has been very busy of late removing his offices, &c., and must have mislaid the reports referred to. [I have copies of all reports sent out by me.]

St. Austell, Jan. 15.

THOS. PARKYN.

### THE EMMA AND EUREKA MINES, AND THE SALTING OF THESE, AND THE LAWRENCE-WHITNEY ARREST.

SIR,—I think it is high time that someone here should come forward and publish the facts about the Eureka Mine, in order that Messrs. Lawrence and Whitney may have the benefit of the truth—whatever that may be in this case. Not having the honour of being an American citizen, I have hesitated to meddle in a matter which belongs exclusively to the citizens of the Republic; but I cannot allow any longer such delicacy to prevent me from putting in a word in behalf of the accused, when the charge of "salting" this mine is so ridiculously absurd, and can only be the work of crazy, disappointed men. I know nothing of the business of the Eureka Mining Company, and I am thoroughly ignorant of the value of its stock, and I do not want to know anything about either; but I wish it to be understood that what I am about to state is first due to the accused gentlemen; and, secondly, it is but just to the Territory that the charge of "salting" that or any other mine should never be permitted to go before the public, without being met by flat contradiction, when that can be truthfully done. Personally, and without any remuneration whatever, I reported twice on the Eureka Mine, at the request of my own personal friends here in this Territory, and I feel, therefore, at liberty (in consequence of holding no shares or any interest directly or indirectly in the mine) to state that the accusation of "salting" the Eureka is as false as that brought forward by the celebrated pamphleteer Paffard, of London, the Quixotic historian of the Emma Mine, who stated that this great property had been "salted" in a most cute and mammoth manner by Yankees; and, for the occasion, his crazy imagination gave to the world the elegant designation of "plastering." I am so fully satisfied of his crazy folly and nonsense that I have gone in for the "plastered" mine, by the purchase of 60 shares, and my agent in London can visit the meetings with a little more than one solitary share, and not a la Paffard.

Let the reader think of the work necessary to be done in "salting" or "plastering" a mine like the Emma. To accomplish such a feat would require the skillful labour of at least 100 men for two years. It would be necessary to sink about 400 ft. and to drive several levels, hoisting all the barren rock to the surface, and then letting down two million dollars worth of ore to "salt" and "plaster" the vacant openings. Is it not a little singular that the names of the two great accusers of the "salting" of the Emma and the Eureka should sound so much alike; they are a noble pair, and will, doubtless, be handed down to posterity—should they not shortly reach a lunatic asylum, and then, in sympathy for their misfortune, they could be passed by in silence.

It has become too much the fashion to write of the salting of mines in Utah, but every professional and practical man knows that of the hundreds of thousands of tons that have been sold in this Territory, and the hundreds of others that have been offered for sale, there is only indubitable evidence of one solitary case where the dangerous business of "salting" a mine was really done. I think that the miners of Utah can congratulate themselves, however, in not having figured with an aristocratic gigantic "diamond salting."

I have lived in this Territory nearly three years, and have visited all the mining districts repeatedly, and I think there are too many good mines here to tempt any sane persons to ply this unprofitable trade, the detection of which is as certain as day following night. I unhesitatingly state that there are scores of experts and practical mining men who could testify that the charge of "salting" the Eureka is the most arrant nonsense that could be uttered; and it is the general opinion of the best informed here that the arresting of Messrs. Lawrence and Whitney is a "little game" to browbeat those gentlemen, and to place them before the Court in such an unenviable light that the damages claimed may be awarded their accusers. Directors of some companies when they find out that their own mismanagement, as well as that of their incompetent pet local managers, produce a collapse, and no dividends, as a last resource get into the habit of saddling all the blame on the quality of the mines, and then go for the vendors, accusing them of "salting," or anything else, to get out of their scrape.

Finally, let me say that to "salt" the Eureka it would require almost as many men, and as much time, as I have already stated would have been required to "plaster" the Emma. No doubt the miners of Tintic will come forward and disprove the charge of "salting" the mine, by which the accusers have made themselves so unpopular in the district. Let us stand by the right.

Salt Lake City, Dec. 20.

HENRY SEWELL, Mining Engineer.

NEWS FROM CAMP FLOYD AND TINTIC.—From Mr. W. T. Golden, Superintendent of the Silver Cloud Mine, near Lewiston, who has just returned from Tintic, we learn that there has been a heavy snowfall in that region during the last two weeks. In Lewiston it is 1 ft. in depth, and 2 ft. or 3 ft. on the surrounding mountains. On the Mammoth Copperopolis Mine, in Tintic, it is 2 ft. deep, but does not interfere with the working of the mines. The Silver Cloud Mine has struck a fine body of ore, and is in a prosperous condition. Times in Lewiston are tolerably lively, and the mill at Camp Floyd is working to the satisfaction of everybody. A complimentary testimonial to Mr. Henry Sewell has been got up, thanking him for his skill and perseverance in bringing out the mining interests of the district, and has been universally signed by the residents of Lewiston and the surrounding country.

CAMP FLOYD AND BEAVER.—Three bars of high grade fine specimen silver bullion, from the Sunnyside and Lion Hall Mines, Camp Floyd, are on exhibition in the window of Water's Store, near the First National Bank. A splendid specimen of silver ore from the North Star Mine, Beaver county, may be seen at the same place.—Salt Lake Tribune.

VALUABLE DISCOVERY IN HOLCOMBE VALLEY.—The people of San Bernardino are much excited in regard to a wonderful discovery of gold quartz in Holcombe Valley. The ledge is of immense size, and many persons have gone there. Measuring claims with tape-line is the business of all the people. The discovery was made by Mr. Charles Carter on the 21st ult. From the amount of gold found in the valley, the gold-bearing specimen through it, it has always been believed that a mammoth ledge was situated somewhere in the adjacent mountains. For years diligent search has been made for it, but without success. The mountain in which the ledge was discovered is situated in the eastern part of Holcombe Valley, about 3 miles east of the Haley Company's Quartz Mill, and 300 or 400 yards from the renowned Spanish ledge. The ledge, it is reported, projects some 50 ft., and is very nearly 30 yards wide.

MINING ON THE PACIFIC COAST.—The mining companies of this

Coast which are listed on the Stock Board paid in dividends in 1873 the sum of \$13,440,181. Assessments levied during the same time sum up \$8,671,043. This leaves a balance of \$8,814,000, which stockholders have put in their pockets. This money paid for assessments was in a great part paid out for labour, so the miners and others were benefited by it. Of course, the labour production is much greater, and has been coined and distributed in commercial success, and contributed to the general prosperity of the Pacific Coast, as well as the world.—Mining and Scientific Press (San Francisco).

### CHESTERFIELD AND DERBYSHIRE MINING INSTITUTE.

A general meeting of the Chesterfield and Derbyshire Institute of Mining, Civil, and Mechanical Engineers was held at Chesterfield a few days ago.

Mr. FOSTER STENSON read a paper "On Fowler's Hydraulic Apparatus for Loading and Unloading Pit Cages," as used at Hucknall Colliery. It was shown that by the adoption of this apparatus 850 tons of coal could be raised per day, which was an increase of 40 per cent. on the old method, besides which great economy in labour was effected. A discussion on a paper "On Coal-Cutting Machinery," which was read at a previous meeting by Mr. R. F. Martin, came next, and various opinions were expressed.

Mr. EVANS, of Swinton, gave a very satisfactory account of work done by machinery in the pit with which he was connected.

Captain JACKSON said it was evident that machines which were used successfully in one mine were not always adapted to the requirements of another, in consequence of the difference in the coal. He thought the best plan would be to try as many machines as possible on the same coal, and select those which answered their purpose best. He said they intended to adopt that plan in choosing machines for the Clay Cross Collieries.

Mr. HOWE read the result of his observations on the working of machinery in various collieries, from which he had arrived at the conclusion that a very great saving was effected by them.

Mr. EVANS, the Government Inspector of Mines, enquired if that were so how it was they had not come into general use?—Capt. JACKSON said no doubt one reason was that colliery proprietors had not experienced much difficulty in obtaining men until the last two or three years, and they had been content to go on as they were.

Mr. WRIGHT said perhaps the most important reason why machines had not been generally used in that district was because they were not made to "hole" far enough under the coal. They required machines to hole at least 5 ft.

After some further remarks the discussion of the subject was adjourned to a future meeting.

### COAL-CUTTING BY MACHINERY.

ITS PROBABLE INFLUENCE ON THE FUTURE OF COAL MINING INDUSTRY.\*

BY MR. JAS. S. JEANS, OF DARLINGTON.

Some of the wisest philosophers have taught us that the more a man has learned the more he finds he has to learn; and we are all familiar with the sage reflection of Sir Isaac Newton, who, with all his knowledge, declared that to himself he seemed to be like a man walking by the sea shore, and gathering here and there a stray pebble, while the great ocean of truth lay all undiscovered before him. Some such thought as this occur to my mind when I survey the very wide question of the potential results of the application of mechanical appliances to coal mining. It is a subject upon which I have bestowed some little attention, otherwise I should never have presumed to appear before you this evening; but it is also a subject respecting which the more I study the more I am impressed with its vast scope and importance. Nothing is further from my thoughts than to read you a historical essay on the triumphs and failures of coal-cutting machines. Many volumes would be required to do ought like justice to such a task. All that I now propose is to speak of certain well attested results of the operation of coal-cutting machinery, to lay before you some interesting facts and calculations with which I have been furnished in further attestation of these results, and to draw your attention to certain important conclusions which may be deduced therefrom. Before attempting this, however, let me briefly put you in possession of the following preliminary facts:—

The idea of substituting mechanical appliances for hand labour in the hewing of coal is not a new one. From a paper read some years ago before the North of England Institute of Mining and Mechanical Engineers I have ascertained that so far back as 1761 one Michael Menzies, of Newcastle, took out a patent for this purpose. In 1762 another patent was obtained; the next patent was taken out in 1783; and the next in 1818, so that between the two latter dates there was a long period of inaction so far as this sphere of invention is concerned. Other patents followed in 1830, 1843, and 1846 respectively. From 1846 to 1852 no fresh patent was taken out, but between the latter year and 1864 no less than 12 new patents were obtained. In 1866 Gladhill took out a patent for cutting coal by an endless chain and jib projecting from the side of the machine and forced through the coal by the forward motion of the carriage. This patent has since been modified and improved by Messrs. William Baird and Company, of Glasgow, and it is now known as the Gartscherrie Machine, by which name I shall again have occasion to speak of it. Up to the period at which we have now arrived very little encouragement was given to the patentees of coal-cutting machines. It is probable, indeed, that in no phase of human invention had ingenuity and money been spent to so little purpose. People had not then learned to face the probability of an ultimate exhaustion of our coal supply; nor had they experienced the expense and inconvenience of a coal famine. The output of coal was sufficient and often more than sufficient for all our requirements. Coal that now costs 16s. to 20s. per ton was then a drug in the market at 3s. to 4s. per ton, so that there was no direct incentive to substitute mechanical for hand labour. But some eight or nine years ago the extraordinary increase in the production of coal (which advanced from 65 million tons in 1855 to 98 million tons in 1865), and the equally remarkable increment of consumption (which advanced from 2 tons 13 cwt. and 5 lbs. per head of the population in 1855 to 3 tons 13 cwt. 2 qrs. and 24 lbs. in 1865), caused more attention to be paid to the question of coal mining, not only by coalowners, but also by statisticians and political economists. In the session of 1865 the Council of the North of England Institute of Mining and Mechanical Engineers appointed 13 of their number to report upon the performance of any coal-cutting machines which might be on their trial; but the only report that these gentlemen ever made was that they had not been favoured with any communications on the subject, although they made enquiries in all the principal coal mining districts throughout the country. In a paper read before the mining and mechanical engineers of the North in the season 1864-65, Mr. T. W. Embleton stated that there were then three machines in operation—one upon the slotting principle at the Kippax Colliery, near Leeds; Firth's machine, on the pick principle, at Hutton Colliery; and Harrison's rotary machine at the Bishop's Close Colliery. From 1761 to 1869 there were altogether 104 patents taken out for coal-cutting machines, and of this large number I think I will be safe in saying that not more than half-a-dozen are now in successful use, whilst the vast majority have long since been relegated to the limbo of unlucky ventures.

In speaking of the results of coal-cutting machinery, we are bound to take into account the best results of the best machines yet invented. The adoption of this course will probably lead to what some would call invidious distinctions, but in no other way can we secure a fair datum line from which to draw our conclusions. The best results already obtained by coal-cutting machinery are likely in course of time, and as that class of machinery becomes more perfect, to take the rank of average, or it may be, of the worst results. In this direction there is such unlimited scope for progression that we cannot possibly stop where we are. So far as I have been able to ascertain the machines most generally and profitably used at the present day are those of Mr. William Firth, of Leeds, and the Messrs. Baird's Gartscherrie coal-cutter. Respecting the former, the patentee

\* Read at a meeting of the Cleveland Institution of Engineers, on Thursday.

read a paper before the British Association in August last. He stated that in "long wall" working one of his machines would, under favourable conditions, cut 20 yards in an hour to the depth of 3 ft., but 10 yards per hour, or 60 yards in a shift, was very good work, being equal to the day's work of 12 average men, whereas a man, a youth, and a boy were the only persons employed to work the machine. It is true that three are sufficient to work the machine—that is, to remove and lay down the road and clear away the debris; but that number does not fairly represent the total amount of labour necessary to get the coal, for in working with machinery, as in working by hand, it requires hewers, brushers, deputies, putters, and other colliery operatives to bring the coal to bank, and partial statements like that made by Mr. Firth are calculated to convey to the non-practical mind the impression that the services of all these hands are more or less dispensed with. Firth's machine has been at work at the Hutton Colliery for ten years, with longer or shorter intervals of repose. Its results have been variable, but, on the whole, satisfactory. The principle of the Firth machine is not, however, theoretically sound. Like the Leyick and Jones machine (which was also tried at Hutton in 1867), it is found that one-half the power necessary to work the machine is lost in drawing the pick back to strike another blow. In any rotary machine, such as those of Baird's and Winstanley's, all this loss of power is avoided, so that to this extent the one principle is much superior to the other. The simplicity of the Firth machine, and its consequent non-liability to get out of order, are, however, advantages of great importance, and have more than once led to its preferment over other machines that are more theoretically perfect according to the canons of engineering science. A table with which I have been supplied from a private source shows that in experiments made at Hutton Colliery there was a difference of 8.42 per cent. in favour of the Firth machine, as compared with hand labour, in the production of best coal.

With reference to the Gartscherrie machine, I speak the candid opinion of many practical men, and without any conscious partiality, when I say that it is the most perfect that has yet been devised. For the last six or seven years the Messrs. Baird have carried out successive improvements on this machine at a large expenditure of labour and money. Until last year it was used only in the collieries belonging to the Gartscherrie firm, where it regularly cut from 300 to 350 feet per shift of eight hours, representing a yield of 75 tons of coal. The first of these machines introduced into England found its way to the Hutton Colliery, where it has now been at work for nearly twelve months. Of its operation at Hutton I am in a position to give you some accurate data, obtained over a long course of experiments, although not under the most favourable circumstances. Let me say here, for the sake of consciousness, that the principal advantages claimed for the Gartscherrie machine are—1. A diminished cost of production. 2. An improved ventilation. 3. A reduction of waste; and 4. A relief of the miner from the hardest part of his toil.

It is highly important to ascertain the extent to which these conditions are fulfilled. Its application has not yet been tried on a scale sufficiently large and complete to give a definite idea of the minimum cost of production, nor are we likely to arrive at this result for some time to come. At the Hutton Colliery, however, the following approximate estimate, based on the result of a year's working, gives the cost and the number of men required to remove 120 yards of coal (equal to 130 tons) hewed or loaded by the Gartscherrie coal cutter.

No. of men.	Cost.
24 hewers, per ton	1s. 6d.
8 deputies, per ton	0 5
6 putters, per ton	0 2½
6 men at cutters	0 3½
3 brake and foremen	0 1½
2-49 men repairing cutter chain	0 1½—2s. 7½d.
To get the same quantity of coal at Hutton Colliery by hand hewing would require	
No. of men.	Cost.
67 hewers, per ton	3s. 3d.
6 putters, per ton	0 2½
6-76 deputies, per ton	0 2½
Showing a difference in favour of the coal cutter of 1s. 2d. per ton	

At the Espieside Colliery, belonging to the Messrs. Baird, the Gartscherrie coal cutter required to produce 120 yards of coal (equal to 80 tons), as per data, supplied by Mr. Wm. Stevenson, the underground manager:—

No. of men.	Cost.
15 hewers, per ton	1s. 6d.
10 brushers, per ton	0 5
5 putters, per ton	0 2½
5 men at cutter, per ton	0 3½
2 brake and foremen, per ton	0 1½
2-37 men repairing cutter chain	0 1½—2s. 13½d.

The difference of 6½d. per ton between Hutton and Espieside is due to the fact that the seam worked at the former colliery is 4 ft. thick, whereas at the latter colliery it is only 2 ft. 6 in. In both cases, however, it is assumed that the coal is brought 130 yards from the face of the workings by the putters.

In these calculations no allowance is made for the cost of the motive power required to work the machinery. In the earlier days of mechanical coal cutting, there was a considerable difference of opinion as to whether compressed air or water was the cheapest and most practicable power. Water was used by Baird to actuate his machine, but by far the greater number of such machines have been worked with compressed air. Although it has been urged that in the use of compressed air a portion of the power is lost by displacement of the latent heat, whereas by the use of water the only loss is that arising from friction, it is now universally admitted that air is a more reliable and more advantageous motor for this purpose than any other. To generate the compressed air involves the cost of a considerable quantity of fuel; but that quantity will vary very little, whether the number of machines at work is one or a dozen, and at the pit mouth its cost will not be seriously felt. I am not in a position to give even an approximate idea of the consumption of fuel necessary to work the Gartscherrie machine; but if we assume that it will represent 1d. per ton on the gross output, and that other incidental charges such as those necessary to keep the machine in order, will be covered by 1d. per ton more, we have a residual economy of 1s. per ton by the substitution of mechanical for hand labour. By this calculation, then, we arrive at the fact that if coal-cutting machinery were universally adopted there would be an economy of at least 6,000,000l. effected in raising the 120,000,000 tons of coal now actually produced in the United Kingdom. I say at least 6,000,000l., because there is no doubt if our collieries were worked entirely by mechanical power, the difference in favour of coal-cutting machinery would be very much greater than any amount hitherto obtained have proved to be practicable.

Another important consideration germane to this phase of our subject is the extent to which the application of coal-cutting machinery would reduce the number of colliery operatives. The results obtained at the Hutton and Gartscherrie Collieries proved that by using coal-cutting machinery 49 men can do the same amount of work as 79 by hand-hewing. But the more extensively coal-cutting by machinery is adopted the greater this reduction will become, and I shall certainly not be overstepping the mark if I estimate that we could dispense with at least one-half of the men now employed in our coal mines in the event of mechanical hewing becoming the rule instead of the exception, or, in other words, the 418,088 men employed in raising our output of 125,385,853 tons of coal last year might be reduced to 200,000. The transition from hand labour to mechanical will probably be so slowly accomplished that we shall never be able to realise the full value of this reduction. We need not, in an alarmist spirit, contemplate the possibility of 200,000 men being all at once, and without warning, deprived of employment. The commissioners appointed to enquire into the probable extent and duration of our coal supplies have calculated, on the basis of diminishing ratios, that within a hundred years from now our home consumption of coal will reach the gigantic total of 274,000,000 tons per annum, or considerably more than double the total output of coal at the present time; and if our export trade is increased in the same ratio, the production of coal in the United Kingdom will be nearly four times greater in 1974 than it is likely to be during the current year. The large and rapid development of our coal resources will so keep pace with the substitution of mechanical for manual labour in our mines that there is no reason why trades unionists or any other class should fear the effect of the change. On the contrary, there is already such a dearth of skilled miners throughout the country that we shall have the utmost difficulty in keeping the supply of coal abreast of the demand unless this change is permitted to take effect. The Government Inspectors' returns show that the number of miners employed in the United Kingdom advanced from 370,851 in 1871 to 418,088 in 1872, being an increase within a single year of 47,237. This increase is not a natural one; it is not dependent upon those who are "native to the manner born," but is due to a large external accretion of operatives recruiting the ranks of our miners from other kinds and branches of labour. The introduction of coal-cutting machinery seems to be the only means of so regulating the demand for colliery labour as to enable the supply to respond to it in an even and natural way.

2.—The next great merit claimed for coal-cutting machinery is an improvement in the ventilation of our mines. Everybody knows that good ventilation is one of the greatest desiderata in coal mining, that the miner's health and safety are dependent upon it; and that, while it is one of the most essential, it is one of the most difficult duties of the mining engineer. The question of ventilation is, moreover, closely bound up with the extent and duration of our available coal supply. It has often been to me a matter both of surprise and of regret that the Commissioners appointed by Parliament to enquire into this subject took so little heed of the effects of coal-cutting machinery in relation thereto. The report of the Commission itself, dated July 27, 1871, contains no allusion whatever to this phase of their enquiry, and only one of the five committees appointed by the Commission to deal with different branches of their enquiry refers to it in any way. This is the committee that dealt with "possible depths in working," and it dismisses the subject of our paper with the remark that "the more general introduction of coal-cutting machines, worked by compressed air conveyed into the mine by pipes, would have some effect in lowering temperature, and would at the same time supersede the labour of hewing, which from its hardsome nature is that form of labour against which high temperature chiefly militates. Mr. Lindsay Wood states in his evidence that the air discharged from the pneumatic coal cutting machine is 1. raised by expansion in the heat of escaping to a temperature of 70 Fahr. below freezing, and that the air from one machine is sufficient to lower the temperature of the whole body of air flowing past a working pace of 12 Fahr. He thinks that as many of these machines might be employed at one working face, but it does not follow that the collective action of these seven machines would reduce the temperature sevenfold, because the principle of accelerated absorption by reduction of temperature again intervenes, and would in a great measure defeat the cooling action of the machines." As a regular thing, it is now found that the



use of a single Gartscher machine in the Hetton Colliery reduces the temperature at the working face of 2°, the pressure of air at the cutter varying from 13 lbs. to 17 lbs. Assuming that there is a possibility of employing seven machines in one working face, and that there we reduce the atmosphere in a corresponding ratio, we should find the temperature of the air reduced by 14°. In reference to the present, this is perhaps a matter of little moment, because in most of our collieries the means of ventilation are already sufficiently adequate, or may easily be made so. But it is a consideration of the utmost importance in relation to the future of the British coal trade.

The Coal Commission of 1869-70 adopted 4000 ft. as the limit of practicable depth in working, and based their calculations as to the duration of our supplies thereupon. But Mr. George Elliot did not think it would be possible to work coal commercially at a greater depth than 3000 ft. At that depth a temperature of 100° is met with, whereas the temperature at a depth of 4000 ft. is 116°. Mr. L. Wood, although believing that it would be quite competent for men to work coal at a temperature of 98°, thinks that at that temperature it would require two men to do the work of one in an ordinary way. There are, of course, cases in which men work in an even higher temperature than this. There are certain operations connected with glass-making which require men to work in an atmosphere heated from 100° to 120°, and at the works of Messrs. Chance, of Birmingham, men work in this atmosphere from eight to ten hours three times a week, with an interval of 30 hours between two consecutive workings, without any apparent injury to health. In the stoke-holes of steamers, especially those of the Peninsular and Oriental Company, the uniform temperature is from 100° to 140°, and in the Clifford Amalgamated Mines, in working a valuable lode of copper, men have endured a temperature of 110° to 117°. In all these cases, however, the men had ready access to the fresh air—a condition which could not apply to a coal mine at a depth of 3000 to 4000 ft. Most medical men are agreed that dry air at 100° Fahr. is the limit of human endurance in working, and we cannot, I fear, rely upon our own miners being able to work at so high a temperature. The difference of temperature, therefore, between a depth of 3000 ft. and 4000 ft. must be got rid of by some mechanical means before it is practicable to work coal at the latter depth. Coal-cutting machinery will, undoubtedly, be the chief means to this end. Mr. Brownlee, the well-known engineer, found in constructing the Mont Cenis Tunnel that the compressed air from the boring-machines always reduced the temperature sufficiently to allow the men to work without any serious discomfort. The application of the same force under well regulated conditions should produce the same results in the coal mine. At the present time the deepest pit in England is only 2019 ft. That depth is attained in the Rose Bridge Collieries, at Wigan; but in the Charleroi district there is a pit sunk to the depth of 880 yards. We have not, however, any practical experience of the conditions affecting the working of collieries at the extreme depth of 3000 to 4000 ft. When it becomes necessary to mine coal at such a depth we shall probably have to pay much more for our fuel than we did last year, and by that time we shall have learned to practice economy and husband our resources to a much greater extent than we have yet done.

3.—The next advantage claimed for coal-cutting machinery is a reduction of waste. By waste we understand the small or dross produced in the getting of coal. At the present time, under the most favourable system of working, the ordinary and unavoidable loss is about 10 per cent.; whilst in a large number of cases, when the system of working practised is not suited to the peculiarities of the seam, the ordinary waste and loss amount to sometimes as much as 40 per cent. (Commission of 1869-70, Report C., p. 116.) We shall not greatly err in assuming that the average waste and loss amounts to 20 per cent. In the Hetton Colliery, in a 4 feet seam, the Gartscher machine gives a difference of 16 per cent. In the production of best coal, as compared with hand working, and it has been proved that over 90 per cent. of the coal is of the same quality, or fully 15 per cent. less than the average proportion of waste by hand hewing. In other words, more than 25,000,000 tons of coal are annually wasted in our collieries by the ordinary process of hewing; whereas it is possible by mechanical labour to reduce that quantity to 75,000,000. In some of our northern coal fields, and, indeed, wherever coal is adapted for coking purposes, the great bulk of the waste can be utilised in the coking ovens; but where coal is not coked, waste invariably represents loss. Under the head of reduction of waste, it will be well to notice that coal-cutting machinery can be applied to the thinnest seams, where it is physically impossible or economically unwise to apply hand labour; and a very large additional avoidance of waste may be expected from this source.

4.—The relief of the miner from the hardest portion of his toil is in itself a recommendation which should lead to the universal adoption of coal-cutting machinery, and I do not disclose any secret when I say that it was chiefly with this end in view that the proprietors of the Hetton Colliery have so long persevered with mechanical power. It is often made a just cause of complaint by employers that their workmen throw needless and vexatious difficulties in the way of introducing improved processes and appliances. But he would be an extremely short-sighted and unreasonable miner who would seek to obstruct or resist this improvement. I have shown that coal-cutting machinery is good for the employer, because it diminishes the cost of production, and gives him a greater command over his men; that it is good for the country at large, because it opens up a prospect of extending our mineral resources, and so prolonging the era of our industrial supremacy; and I have now to demonstrate that it is good for the miner, because it will abrogate his irksome toil. The third proposition is so self-evident that it may almost be called an axiom. It is not necessary on the borders of the largest and most productive coal field in England that I should seek to describe the *modus operandi* of hand hewing. It is the hardest, the most enervating and unwholesome, and, I may add, the most brutalising work that falls to the lot of man. Stretched upon his back or upon his side, or cramped and huddled up in a space which no ordinary man could enter, the miner pursues his darksome and cheerless toil, until, at an age when most other men are in their prime, he becomes a useless, decrepid, and prematurely aged man, stricken with asthma and with some other disease which he will carry with him to his too early grave. Surely if it were possible to remove from the miner the hardest part of his labour it would be the duty of the coalowner to do so, irrespective of the cost. But when by doing so he will also benefit himself, and confer permanent advantage upon the country, then I say this duty becomes a bounden obligation, which no man is justified in shirking. The men employed about coal-cutting machinery are so sensible of the relief it gives them that they are content, as a rule, to take less than their ordinary pay. At the Hetton Colliery, the men by hand, getting 2½ tons of coal per man per shift, are paid 28s. per score; whereas the men following the machine are only allowed 12s. 6d. per score. Miners and mineowners apply the term "score" to their mode of reckoning, because it is supposed to represent that number of tubs put out by the miners, but there is sometimes more and sometimes less than a score in the number that forms the basis of reckoning. At the Hetton Colliery the score consists of 21 tubs, each containing 8 cwt. When a coal-cutting machine is used there is little or no excavation by hand. All that is needed is to take up the "hot-ton coal"—that is, the small quantity that the machine has passed over. The hardest work devolving upon the miners where machinery is employed is, therefore, that of filling the tubs, and this is mere child's play compared with the labour of hewing or excavating.

Having had occasion to refer so frequently to the Gartscher machine, I may now be permitted to give you some idea of its form and mode of working; and I do this all the more readily because I believe that up to the present time it has not been described to any technical or scientific society.

The frame of the machine is 6 ft. by 2½ ft. From one of the sides a horizontal jib is distended, round which passes an endless chain, whereon strong steel cutters are fixed. There are also three of these cutters, and they are pressed forward into the coal when the cutting is about to be commenced by the distended jib. A chain wheel on an upright shaft drives the endless chain. The machine is propelled, and its forward motion along the face is given by an eccentric cast on the bevel wheel, which is fixed on the upright shaft already referred to. The straps of the eccentric are connected with a lever which drives a ratchet-wheel. The chain which draws the machine forward is wound round a propelling drum on the shaft of this ratchet-wheel, the other end of the chain being made fast in front of the machine. When cutting commences the endless chain, with the distended jib, moves slowly out of sight under the coal, cutting at a rate varying from ¾ ft. to 1½ ft. per minute. The compressor, which generates the air, is erected at a distance of about 30 yards from the top of the shaft. Its diameter is 18 in., and the length of stroke is 4 ft. At Hetton the compressor is built upon rather a new principle, and until it has been more completely tested it would, perhaps be unwise to speak either of its structural peculiarities or its results. From the compressor to the mouth of the drawing road the air is carried in 6 in. metal pipes, an india-rubber tube taking it the rest of the distance to the machine. In the appendices to this paper you will find a tabulated statement of the work done by the Gartscher machine over a period of some weeks at Hetton, under circumstances that were anything but favourable to testing its full capacity. The men were mostly new to their work, and the machine had scarcely a proper length of face to work upon. Three men are required to attend the machine, each of whom is paid at the rate of 6s. 8d. per shift. Another man is required to "garth" or look after the chain, which is liable to get out of truth, and he is paid at the same rate, as is also the man whose duty it is to shovel the cutters, which are brought to bank for this purpose after every shift. The breadth of the cutters is 1½ in., which represents the width of the face of the groove made by the machine. In the paper read before the British Association in August last Mr. Frith pointed out that it was far more economical, while it was quite practicable to work double shifts with his cutting machine. I do not share the opinion that it would be possible to work double shifts with the same machine. Experience has, at all events, proved the contrary—at the Hetton Collieries after the machine had been at work for nine hours it takes the remaining 15 out of the 24 hours to re-temper the cutter, clear away the coals, and put things generally in order for the next shift. Much, however, yet remains to be done in working out and improving the details of the system.

If I were to speak of other machines now in use at the same length as I have spoken of the Gartscher coal-cutter, I should prolong this paper beyond all reasonable limits. I may, however, say very briefly that among other machines that have recently received a good deal of attention, those of Hurd and Simpson, of Wakefield, and of Messrs. Winstanley and Barker, of Manchester, are not the least prominent. The speciality of the former machine is that the air for working it is obtained from a portable compressor, which can be worked in any mine by animal or manual power, and fixed in close proximity to the coal-cutter. The great cost of compressing the air on the surface, and bringing it to the machine in metal

pipes, as at the Hetton Colliery is thus obviated. Winstanley and Barker's machine is designed for "holing" in mines worked on the "wide work" or "long wall" system. It is driven, like all the others, by compressed air at a pressure of 20 to 30 lbs. per square inch. The cutter holes its own way into the coal, cutting from nothing up to 3 ft., and in working at the Platt Lane Collieries and the pits of the Ince Hall Coal and Canal Company, it has been found that the small coal made by this machine is only 25 to 35 per cent. of the quantity of small coal produced by hand-holing. In hard coal the average rate of holing with a pressure of 30 lbs. per square inch is 25 yards per hour. Another machine now in successful operation is that of Dr. W. J. Clap, better known as the Nant-y-Glo machine. A paper read on this machine before the last meeting of the British Association, stated that it did its work by means of a series of rotating drills, which perforate the coal, and at the same time break down the divisions between the holes bored. There is still another machine, patented by Messrs. Gillett and Copley, which has been tried at the Wharfedale Silkestone Colliery, but with what result I am unable to say. Neither am I able to speak of the merit of the machine brought out some months since by Mr. Simpson, a well-known mining engineer in the West of Scotland.

Before concluding, I may say that the import of the subject to which I have invited your attention may be stated in a single sentence—England's future prosperity must to a large extent depend upon her mineral resources, and these mineral resources will be largely affected by coal-cutting machinery. The experience of the past two years has amply proved that any restriction of or interference with our coal supply, is sufficient to disorganise all the springs of industry, and entail more or less of hardship, mischief, and inconvenience on every class of the community. I do not think, then, that I have at all exaggerated the importance of coal-cutting machinery in reference to the future of the coal trade, nor shall I greatly err in predicting that in the not far distant future it will become to miners and mineowners the question of questions, and receive much more consideration than it has ever done in the past.

#### ECONOMIC CONSUMPTION OF COAL.

The Manchester Society for the Promotion of Scientific Industry, whose opening proceedings were presided over yesterday by the Earl of Derby, have been engaged for some time in preparing an exhibition of appliances for the saving of fuel. It will be held in Peel Park, Manchester, and the opening will probably be held on the 30th inst. The Council of the Society set out with a very comprehensive programme, including every conceivable branch of the question how economy of consumption may be secured, but experience has obliged them in some respects to curtail the original design.

The exhibition will be divided under eight classes:—

- 1.—Appliances which may be adapted to existing furnaces, &c., whereby an improved combustion of fuel is secured, and a direct diminution of the quantity required is effected.
- 2.—Appliances which may be adapted to existing steam-boilers, &c., whereby the waste heat of flue gases, or of exhaust steam, is utilised.
- 3.—Appliances which may be adapted to existing steam-boilers, pipes, and engines, whereby loss of heat from radiation and conduction is prevented.
- 4.—New or improved furnaces (using solid, liquid, or gaseous fuel), boilers, and engines of all descriptions, specially adapted for the saving of fuel.
- 5.—Natural and artificial fuels of all kinds.
- 6.—Coal-cutting and peat manufacturing machines.
- 7.—Domestic and other fire-stoves, ranges, and apparatus of all kinds (using coal, gas, or other fuel) for cooking, or for warming rooms and buildings.
- 8.—Miscellaneous.

As far as can be judged, at the present stage of the arrangements, each of the above classes will be well represented. The Council had originally proposed three other classes, and they were especially desirous of obtaining inventions for producing heat altogether independent of the aid of coal; but in this they have been disappointed. About 500 appliances of the different classes will be displayed in a wooden building, 200 ft. by 50 ft., with three annexes for large exhibits.

The catalogue will include some of the smallest and simplest contrivances, as well as ponderous boilers and engines, with all the latest improvements that have been devised under the stimulus of increasing cost of fuel. It may be stated generally that the exhibition is not confined to novelties. It includes many comparatively old and well-known inventions. The aim of the promoters has been not so much to offer premiums or rewards to inventors as to draw public attention to what has already been done in the required direction, and then to point out the path in which inventive skill may be most usefully exercised. In regard to the saving of fuel in manufactures, it is desired especially to bring under notice the advantages of high-pressure boilers, for it is felt that steam as well as fuel has been wasted. The exhibition will include a globe high-pressure boiler, sent by Messrs. Sanderson and Proctor, of Huddersfield; a tubular boiler, by Mr. G. Sinclair, of Leith, which is capable of working up to 300 lbs. to the square inch; and a 60-horse boiler, by the Pat and Boiler Company, of Birmingham. Among other exhibits in this department are a 4-horse agricultural engine, with spiral bar apparatus for securing greater economy in coal, by Messrs. Young Brothers, of Liverpool; and a patent grate, or series of grates, for furnaces, by Messrs. Bolzano, Tedesco, and Co., of Prague.

There are also a fuel economiser for railway locomotives, mechanical stokers, various machinery for the cutting of coal and making of peat, and a large number of other inventions with the same end in view. The wide range over which exhibitors extend is remarkable. On the one hand we find an excellent artificial fuel easily manufactured and re-manufactured with the aid of silicate of soda and coal tar from the ashes and refuse of an ordinary fire, the discovery and patent of a lady; and on the other hand the drawing of a set of three furnaces, fixed one above the other for the purpose of consuming the smoke and of securing a more efficient use of fuel, contributed by an old captain of the Royal Navy. After seeing his country professionally for 50 years, he is desirous of rendering in his old age further service if possible. The domestic department is well represented, and there is every imaginable contrivance for effecting a saving in the consumption of household coal.

Dr. Crestadoro, the chief librarian of the Manchester Free Library, exhibits an ingenious self-feeding grate. There are also stoves specially constructed for the burning of peat, a novel kind of shovel for feeding fires at the bottom instead of from the top, and a large number of improved housegrates. The general tendency of the inventions in this direction is to lessen the consumption by narrowing the area of the fire, in some cases to shut it out of sight altogether. The model of an invention, which possesses importance from a sanitary point of view, is exhibited by Mr. Stott, of Halifax. This is a ventilating drain, by which the noxious gases are not only destroyed but utilised by being consumed in the fire, with which the drain is placed in direct communication by means of a pipe, which can be turned off or on at will. There will be a large number of drawings and models shown. As far as possible the various apparatus will be in action. Satisfactory service is being provided for the fire grates, and steam-power for such of the exhibitors as may require it. The Duke of Sutherland has been asked to open the exhibition, and it is thought probable that his Grace will consent to take this part in the proceedings.

#### COAL A DANGEROUS CARGO—No. II.

ON THE LOSS OF THE HERBERT GRAHAM, OF NEWPORT.

Last week a long and interesting enquiry was held at the Newport Police Court touching the loss of the Herbert Graham, which was destroyed by fire in September whilst on a voyage to Valparaiso, laden with smelting coal. Mr. Nelson Hewerton (Mayor) and Thomas Beynon, assisted by Capt. H. Harris, Mr. W. Parker, engineer, and Mr. W. Darley, shipwright (assessors appointed by the Board of Trade) constituted the Court. Mr. H. Hamel conducted the case for the Board of Trade, and after giving a description of the evidence to be produced, he called the witnesses.—Capt. Evan Roberts; William Roberts (able seaman); William James, formerly master of the Herbert Graham; Thomas Edwards, shipbuilder, Scilly; James Barber, foreman coal shipper for Webb, Spike, and Bladon; Patrick Donovan, coal trimmer; and Mr. Vassard, of 7, Carlton-square, New Cross, consulting chemist. The substance of the evidence given may be gleaned from the following statement.—The Herbert Graham was a barque, built of wood at St. Mary, Scilly, in the year 1869, and registered at Newport in the same year, of the burden of 337 tons. She was owned by Robert Graham and others, and on this present voyage was commanded by Mr. Evan Roberts, who held a certificate of competency as master, which was lost after the destruction of the ship. The Herbert Graham left Newport on July 1, 1873, manned by a crew of ten, all told. She was laden with a cargo of 538 tons of coal, bound to Valparaiso. Nothing worthy of remark occurred till Sept. 19, when three of the crew were found in the fore-cabin in a state of stupor. They were removed to the upper deck when, in about 20 minutes, they recovered their senses, and stated that the fore-cabin was full of sulphur, which they attributed to the presence of a close stove which was in the fore-cabin, the weather being very cold then. They were removed to a house aft, and the fire in the stove put out. The following day they returned to the fore-cabin, and no further complaints were heard. On the morning of the 22nd smoke was discovered issuing from the fore hatch, which was battened down. In about an hour the hatch was taken off, and it was then discovered that the ship was full of smoke, which clearing off in about ten minutes enabled the master to go into the hold. Upon descending he found that the cargo was on fire, and that all the hatches were then closely battened down, and the ship's course directed towards the land. The following morning they sighted the land in the vicinity of Port Santa Cruz, but, falling calm, after consultation it was decided to open the hatches and throw overboard part of the cargo in the hope of reaching the fire. In about ten minutes after the hatches had been taken off flames burst up from both fore and main holds. In this state of things, and being powerless to control the flames, the crew were sent to the boats, the master, mate, and boatswain remaining on board till about 2 P.M. of the 23rd, when for their own safety they were

obliged to abandon the vessel and pull towards the shore. At 3 A.M. on the following day they saw their vessel disappear. On the 25th they landed near Cap Virgin, on the coast of Patagonia. In landing one of the crew fell overboard, from the effects of which and exposure on shore he died, and was there buried. From that place they proceeded in their boats 50 miles up the Straits of Magellan, but finding the wind against them and their provisions getting low they once more landed. The captain then estimated they were 200 miles from Sandy Point, a penal settlement of the Chilean Government. They had then six biscuits each, and they decided to walk up to Sandy Point, and started on the morning of Saturday, the 27th, and after a good day's walk they came across a river, when four of them went back to the boats and the other five proceeded on their proposed journey, which they accomplished in eight days, and reached Sandy Point on Sunday, Oct. 5, after having been four days with nothing to eat. They were kindly treated by the Chilean authorities. The four who preferred to go back to their boats proceeded along the shore and fell in with a steamer, which took them on board. They all were brought to England about the end of October. The captain and the crew seem to have done all they could, and only abandoned their vessel for the preservation of their lives.

The evidence of Mr. Barber, the foreman coalshipper, showed that the cargo consisted of five descriptions—Mamhole, Cromserham, Coalbrook Vale, Cwm, and Pautagles coals. These coals were of inferior qualities, and shipped through and through, with rather more small than large. About 70 tons were shipped by rainy weather, so much so that by 4 P.M. the men were obliged to stop loading. The remainder of the cargo was shipped direct from the colliery, and by the steamer.

Mr. A. Vassard was then called upon to give his evidence, the length of which prevents its being reported this week.

#### ANALYTICAL CHEMISTRY.

Although the progress of the student of chemistry will always depend to a considerable degree upon the ability of the teacher, the use of a good outline treatise much lessens the labour of storing the facts in the memory in readily available form. A work well calculated to serve this purpose has just been issued as one of the volumes of Weale's educational series, and although extending to only 170 pages an enormous number of facts concerning both qualitative and quantitative analyses are carefully given. In the preliminary remarks concise information is given as to the theories adopted by the South Kensington authorities with reference to molecules and bonds, and there is a well-arranged list of the Frankland bonds of most of the common elements, classified according to their highest known atomicities, added to which is the very necessary explanation that, although an atom can never become a perissad, nor a perissad an arid, yet the perissads frequently take the form of triads or monads, and the hexads of tetrad or diads. Cases are given in which all the bonds are engaged, and the molecules complete, as well as those in which the bonds are connected to the bonds of an atom of a similar element, those where we have a diad atom's bonds satisfying each other and forming a monatomic molecule, and those in which the two latter cases occur simultaneously. There is a list of the more important compound radicals, hydroxyl, hydrosulphyl, ammonium, ammonoxyl, sodoxyl, zincxyl, and potassoxyl. These, with a couple of pages of rules for formulating, and a brief explanation of the theory of equations, complete the introductory matter. The notes on general analysis are equally clear and concise, and a large mass of really useful information is given, which will enable the student to economise his reagents, and avoid damaging his apparatus. Ample particulars are also given as to the impurities to be looked for in the reagents, and the method of preparing them for use. The mode of separating the elements contained in a given compound into groups is, of course, given, and by the use throughout the book of various kinds of type, and the graphic formula usually of the science teachers of the Kensington School, the passing of the examinations used by educational department will be much facilitated by using the book.

The volume is at once concise and explicit, and those who use it with the assistance of a science teacher, or even moderate ability, can scarcely fail to satisfy the examiners, and attain a creditable position in the class list.

"A Course of Analytical Chemistry (Qualitative and Quantitative), to which is prefixed a brief treatise upon Modern Chemical Nomenclature and Notation." By Wm. W. PINK and GEO. E. WEBSTER.—London: Lockwood and Co., Stationers Hall-court, Ludgate-hill.

WHAT TO SELECT, WHAT TO AVOID.—The January number of Mr. F. W. MANSELL'S Investors' and Shareholders' Guide, published under this title, contains, in addition to a good review of the General Investment Market, articles specially relating to mining affairs, which will be of considerable interest to the readers of the Journal. Referring to "Our Lead Mines as a Sound and Profitable Investment," he observes that to those who have selected mining as the channel for the investment of capital it is pretty generally known that lead mines possess many substantial advantages, as compared with properties producing other minerals; for instance, the deposits are invariably more uniform in their productive-ness, much more readily and extensively explored and brought into a commercial condition, while the value of the product is less liable to fluctuations in value, and always commands a remunerative price. It is for these reasons that we find well-selected lead mines have been worked for centuries past by private individuals, who have amassed enormous fortunes. We need only refer to the Marquis of Westminister, Earl Powis, Earl Vane, Earl Lisburne, Duke of Devonshire, and Earl Dudley in proof of the fabulous wealth that has been yielded for generations past by our lead mines. During the last few years the public have had the opportunity of securing an interest in several lead-yielding properties, which have produced, and are still producing, such results as cannot possibly be realised from any other class of investment. Scarcely four years have elapsed since the Van Mine was acquired by a company for 47,000l., divided into 12,000 shares of 4l. each. This property had been worked by two private individuals, but only with limited success, from want of adequate capital; but since it has been in the hands of the present company an increasing success has attended the whole of its operations, and the result has been that the shareholders have received dividends at the rate of between 60 and 70 per cent. per annum. The American mines attracting the greatest attention at the present time are, of course, the copper mines, and there are some useful remarks upon "Special Investments Ensuring a Fixed Interest," as well as the usual information as to prices, &c. The circular is altogether worthy of attentive perusal.

#### PRICES OF MATERIALS.

As charged at the PROVIDENCE MINES during the following months:—			
Description.	per cwt.	Aug.	Sept.
Hoop iron .....	18s. 0d.	18s. 0d.	18s. 0d.
Blister steel .....	56 0	56 0	56 0
Best boiler steel .....	60 0	60 0	60 0
5 in. patent nails .....	22 6	22 6	22 6
4 in. ditto .....	24 0	24 0	24 0
3½ in. ditto .....	26 0	26 0	26 0
2½ in. ditto .....	4 0	4 0	4 0
White lead .....	—	—	13s. 6d.
White lead .....	—	24 0	—
Best leather .....	—	2 1	—
Norway timber .....	11d. & 1s.	11d. & 1s.	11d. & 1s.
Red pine ditto .....	1 5	—	—
M. C. coals .....	20 0	20 0	21 0
Best coals* .....	5 6	5 6	5 6
Tallow .....	—	—	47 0
Olive oil .....	—	4 3	—
Powder .....	—	42 0	42 0
Safety fuse .....	0 4	0 4	0 4
Rope .....	42 0	42 0	42 0
Comp. .....	0 5½	0 5½	—
White yarn .....	0 5	0 5	—

\* Registered red wick, burn 3½ to 4 hours. † Delivered free.

THE GLOOM AND THE BRIGHTNESS OF CORNISH MINING.—Wheal Owles twelve-weeks account, to Nov. 8, was held on Friday, when the cost-book (which shows every penny paid, if to the smallest stamp boy or girl) disclosed that the mine was actually in debt 1824l. 3s. 1d. to the bank, with 30 tons of tin as an asset. The seriousness of the situation for adventurers—the perplexity and cares of the purser and agents—may be put in very few words. One of the oldest and most economically worked mines in the neighbourhood has suspended its regular payment of dividends or making of profits, has changed its accustomed working bank balance of about 2000l. into a debt of about 1824l., and has entered on the serious—we sincerely trust it may be also the fortunate—responsibility of withholding tin, in the hope of higher prices. Yet the gloom at Wheal Owles is no so dense or general but that some bright rays pierce it. First, the most implicit confidence in Capt. Royns, of Boswedden. Mr. Alfred Chenhalls, the second largest adventurer, stated at the meeting that—come woe or war, let him stock all tin, or sell all, or direct the fortunes of Wheal Owles as he would—every shareholder had the firmest trust that nothing would be left undone to save from disaster. Next, the new, or Wheal Edward, part of the extensive consolidated sets has improved, and the appearances are very promising. Portions of the tin lode there were shown. All the stones were rich—especially so. Again, exceptional interruptions to the working of the mine—influx of water, breakages, &c., causing repeated and harassing delays—have taken place. These are not likely to recur, and it is hoped that Wheal Owles will share in the benefits to accrue to mining generally from a higher price for minerals, and the lower cost of coal and iron. Finally, the St. Just men themselves—those who best know the mineral resources of their locality—are showing their undoubted confidence in their own district. They are buying at the present low prices any available shares in Botallack and Wheal Owles. The latter are rarely in the market, but two recently presented themselves for sale, and were quickly bought by adventurers. Three Botallacks have also been purchased by holders in that mine. When affairs take a turn these plucky but keen speculators will smile pleasantly on the timid realisers in hard times. We have tried to show that—with cause for anxiety, redoubled effort, and the strictest economy, there are gladsome gleams for western tin mining.—*Cornish Telegraph*.

"YOUR (DR. LOCOCK'S) PULMONIC WAFERS are invaluable for the Voice, Throat and Chest. All persons suffering from Bronchitis, Hacking Cough, and DEPRIVATION OF REST, should take them."—From Mr. Earle, M.P.S., 22, Market place, Hull. In Asthma, Consumption, Bronchitis, Coughs, Colds, Gout, Rheumatism, and all Hysto-ri-cal and Nervous Pains, instant relief is given by Dr. Locock's Wafers, which taste pleasantly. Sold by all Druggists at 1s. 1½d.

HOLLOWAY'S PILLS.—EXCELLENT PILLS.—The resources of medicine and chemistry were long and fruitlessly tried before they yielded a remedy which could overcome disorders of the stomach and nerves, till Professor Holloway discovered his purifying and tonic pills. These are the safest and surest correctives of indigestion, heart-burn, flatulency, torpidity of the liver, twinges, nervous fancies, despondency, low spirits, and declining strength. Holloway's pills supersede all irregular action in the body, and so strengthen and support the system that disease departs, and leaves the patient not at all shaken. This is the grand aim and object of medical art, to regulate disordered functions without damaging the constitution by the remedy, and admirably is this end attained by Holloway's pills.



## Meetings of Public Companies.

## THE NEW DOLCOATH TIN AND COPPER MINING COMPANY.

An extraordinary general meeting of shareholders was held, on Tuesday, at the offices of the company, Threadneedle-street, to consider, and if thought expedient, to pass a resolution to the following effect:—"That the directors are hereby authorised to borrow for the purposes of the company, any sum not exceeding in the whole £6000, and to issue by way of security for the re-payment of the principal sums borrowed (with interest at such rate as shall be agreed on) debentures having three years to run, charging the same on all or any part of the property of the company."

Mr. W. G. CLARK in the chair.

Mr. THOMAS R. COMYN (the secretary) read the notice convening the meeting, when the CHAIRMAN said that a number of shareholders suggested that this meeting should be adjourned, in order to more fully consider the best manner to carry out the object of the resolution embodied in the notice. The board fully concurred in that suggestion, and were perfectly willing to support such a proposition.

After some discussion, and it being considered desirable that further information should be gained relative to the present position and future prospects and management of the mine, it was unanimously resolved that the consideration of the resolution be postponed till a meeting to be held subsequent to the 31st inst., due notice of which the directors are requested to give to the shareholders.

## BOG MINING COMPANY.

A special general meeting of shareholders was held at the offices, Austinfriars, on Wednesday.

Colonel CORBETT, M.P., in the chair.

Mr. W. J. LAVINGTON (the secretary) read the notice convening the meeting.

The CHAIRMAN said it was his duty to state the circumstances under which the directors had convened the present meeting. It would be recollected that in March a resolution was passed at a special meeting for raising £6000 additional capital by the issue of 3000 shares of 2s. each. Unfortunately, only about one-third was applied for—1057 shares—so that the directors had been decidedly financially short for some time, and it had been necessary to turn about and see how funds could be got for developing the mine; especially as they had found there was no disposition on the part of the shareholders to come forward and assist. The directors were very anxious to see the bottom of the mine previous to making any further appeal to the proprietors, and had exercised their borrowing powers to the extent of nearly £5000, in the hopes that upon the favourable results attained when the bottom had been reached, shareholders would come forward and take up sufficient shares to enable the directors to carry on the operations without further difficulties. However, such had not been the case, which compelled the directors to look about for other means whereby to obtain the necessary funds. It had been thought to wind up the present company, and to form another, but he was glad to say that would not now be necessary, as an offer had been made to supply all the requisite money upon debentures to enable them to go on till the work that was now in progress had been completed. The reaching of the bottom of the main shaft had been a very great work, and one of considerable difficulty and danger; and, so far from being discouraged at the time it had taken, he was only surprised it had been done at all. The nature of the lode had not deceived them in any way, although it had been found that the "old workers" had filled up with debris all the levels from which they had extracted the ore, so that really they had had to clear all these explorations, which had caused great delay. They now knew there was lead at the bottom of the mine, to be laid open as soon as they had sunk to the deeper level—157 fathoms below the boat-level; and there could be no doubt that by driving out many hundreds of tons of lead would be laid open. Money, however, was required to continue the sinking of the shaft, and there were very good prospects of splendid results being realised eastward, but to obtain them they must have a winding-engine at the main shaft, and use the present engine at the other shafts to the east of the present mine, and sink then 30 fathoms, and strike out into new ground. It was the east towards the Stiperstone Hill that had kept up the riches of Old Snailbeach, and there could be no doubt whatever that there was as good an undeveloped mine to the east of the present Bog Mine as there had been to the west, which they saw the lead going down between the bottom of the main engine-shaft. They calculated 3000, would complete these works, and he had the pleasure to state that they had an offer from a large and wealthy shareholder, who had been engaged in mining all his life, and had unbounded confidence in Bog, to lend the company such a sum of money upon mortgage debentures as would enable them to pay off all the present liabilities, and to carry out the necessary mining operations. Therefore, instead of asking the shareholders to pass a resolution to wind up the Bog Company, he would ask them to allow an adjournment for a fortnight; and in the meantime a circular would be sent out convening another meeting to authorise the directors to borrow such sum of money, because it would be more than the directors had power to do under the Articles of Association. He was at the mine yesterday, and saw large pieces of lead brought up from the bottom; last month there were sold 35 tons of lead, which realised 14s. 4d. 6d. per ton, and another 35 tons were being prepared for next month; the following month would be the same, but the month afterwards there would be 60 tons; so that as soon as they could fairly be at work the returns would pay the expenses of development, and a little increase would be net profit. The present company had expended about 13,000, over and above the value of the returns, and the old shareholders had expended a large amount of capital previously. They not only knew they had lead, but they also knew it was got very cheaply when compared with most mines—it was now being got for 5s. per ton, which was much less than the average, but he believed Capt. Harris expected to get it at 2s. per ton less when the next level had been reached. Their dues were less than their neighbours; indeed, he had no hesitation in saying that there was no mine—when it had overcome its present difficulties—that had before it such a career of prosperity. He then moved that the meeting be adjourned.

Capt. HARRIS (the manager) endorsed the Chairman's statements with regard to the bottom of the mine, and also that of great portion of the deeper levels having been found filled with debris. This had to be cleared to develop the places that were available. The old company, before suspending operations, worked 7 fathoms below the 163, but the prospects of the lode at the bottom were most encouraging. The sinking of the shaft was being pushed on with all speed, and 24 pitches had been set, with two men in each pitch, at an average of 5s. 7s. 18d.; at the 163 the men were paid 5s., for which they had to clear a great deal of stuff. When the 175 had been reached—in about ten weeks—they would commence driving upon the course of the lode, and lay open profitable ground. In six months from the present time he thought they would be in a very favourable position with regard to the returns. In the 182 the lode was worth 4 tons per fathom, and the ground easily wrought. When they reached the next level additional supplies of ore could be obtained. He calculated that in six months hence they would be returning 100 tons per month.

The proposition having been duly seconded, the meeting adjourned.

A vote of thanks to the Chairman and directors was passed.

## SOUTH WARD MINING COMPANY.

A general meeting of shareholders was held at the offices on Tuesday.

Mr. W. A. THOMAS in the chair.

The accounts showed cash balance due to the treasurers 2617.8s. 4d., and a balance of liabilities over assets of 8347.15s. 4d., taking in the extra four weeks' cost in the year.

The CHAIRMAN stated that there was little to do beyond passing the accounts now submitted, and making such call as was necessary to meet the current expenses and liabilities of the mine. For this purpose he suggested that a 5s. call should be made, which, after some little discussion, was carried *unanimously*. He (the Chairman) then read the report of the agent (Capt. Richard Goldsworthy), who was present, and who, in answer to many enquiries as to the future prospects of the mine, said that he had great confidence in the ultimate success of the undertaking. There was much work to be done to bring the mine into a profitable position, and he would use all his energy to accomplish so desirable an object, at the same time exercising a rigid economy in the outlay of the shareholders' money. By the next meeting he hoped to announce the cutting of the side lode (believed to be the North Hooe lode), and should that turn out to be as productive as he anticipated it would decide the future development of the mine. It has been suggested that the shaft should be sunk intermittently to the 90, but he would prefer to see the side lode, which dips towards the shaft, before recommending the necessary outlay. He (Capt. Goldsworthy) stated that since he had charge of the mine he had driven 223 fathoms, and stopped 70 fathoms of ground.

Mr. LAW (the secretary) said that he was at the mine last week, and had much pleasure in testifying to the admirable manner in which the surface operations were being carried on.

A special meeting was held prior to the general meeting for the purpose of forfeiting shares, but as the principal delinquent is absent abroad it was determined to give three months' grace for payment. A novelty introduced to the shareholders in the shape of a photograph of the surface works, and a well-executed drawing of the vicinity of the company's property, by Mr. Adam Murray, was much approved by the shareholders present.

The report of Capt. R. Goldsworthy was as follows:—

Jan. 12.—I beg to hand you the following report. Since the last general meeting the 72 ft. level south has been extended 15 fms. 2 ft.; the north end 19 fms. 6 in.; the 60 south 16 fms. 5 ft.; cross cut driven east from this level 5 fms. 1 ft.; the 40 south 2 fms. 4 ft. 6 in.; and the 25 north 16 fms. 6 in.; total drive, 75 fms. 1 ft. 6 in.

Throughout the drive of the 72 south the lode has been discovered by cross-heads or joints, but as the end is extended south no doubt the lode will be found as productive as it has been in the 60 ft. level above. In the 72 north and through the greater portion of the drive the lode produced stones of lead; in the end the lode is 2 feet wide, composed of floukan, spar, mundie, blende, and a little lead—a promising lode. In the 60 south for the last 10 fms. the drive has laid open ground that will produce from 3 to 4 cwt. of lead ore per fathom, but in the present end it is not quite so productive, although it has a very promising appearance. The lode in the 40 south has been intersected by a short cross-cut; at this point it is small and unproductive, being still influenced by the slide, which is very large, with a rapid underlay south, but on getting into settled ground there is every reason to expect the lode to be equally productive as it was before cutting the slide. The 25 ft. level north has been communicated with the rise from the 40, which has well ventilated this part of the mine. The stopes throughout the mine are of much the same value as for some time past. The cross-cut east from the 60 south is being driven by four men to intersect the slide lode, which we calculate will be reached by driving from 25 to 30 fms.; this we consider to be an important point, we believe it to be the North Hooe lode, and when cut will I trust be productive, and a guide to the future development of the mine. We sold on Dec. 6 two parcels of lead, No. 1, 7 tons 9 cwt., at 27s. per ton; No. 2, 6 tons 9 cwt., at 28s. 6d. per ton. The engine and machinery are all in good order, and working well.

## SATURN SILVER MINING COMPANY OF UTAH.

An extraordinary general meeting of shareholders was held on Monday, at the City Terminus Hotel, Cannon-street, for the purpose of passing an extraordinary resolution, not requiring confirmation at a subsequent meeting, to the effect that it has been proved to their satisfaction that the company cannot, by reason of its liabilities, continue its business; and that it is advisable to wind up the same voluntarily, and also for the purpose of appointing a liquidator or liquidators to wind up the affairs of the company, and distribute the property. Mr. STRATT in the chair.

Mr. HENRY BROWNIGG (the secretary) read the notice convening the meeting.

The report of the directors stated that they desired to meet the shareholders in order to lay before them a statement of the position of the company, and to pass an extraordinary resolution (a copy of which is enclosed) for winding up the company voluntarily, and afterwards to explain a project for the benefit of the shareholders. The directors felt confidence in the success of the smelting operations at Sandy, inasmuch as the weekly returns showed apparently satisfactory results. When the great financial crisis in America culminated attachments were placed on ore, stores, and tools belonging to the company for the debts then due. The directors were awaiting Dr. Bishop's return from Utah, before deciding upon their course of action, when proceedings for winding up the company compulsory were commenced by Messrs. Blyth, in the Court of Chancery, which have been resisted by the directors, who, believing the shareholders can best manage their own business, have decided to call them together to advise a voluntary winding up, in order that the project before referred to may be submitted for their approval, and if approved action be taken to avoid any further loss of time.

The CHAIRMAN reviewed the circumstances connected with the formation of the company, stating that the prospectus embodied in a report, signed by Mr. Tildon, showing the wonderful character of the property the company was solicited to purchase. The formation of the company differed in many respects from most others, inasmuch as it was not formed by a set of gentlemen calling themselves directors, but by the vendor, who undertook to pay the whole of the expenses in proving the *bona fides* of the property, and in his (the Chairman's) presence tendered 5000, as a fee for the expenses of the report and the journey out and home of any man they might choose to select to verify the statements of the vendor. If those statements had not been verified the 5000 would have been forfeited, and also the expenses in connection with the formation of the company.

After reading the report of Mr. Tildon, and seeing that gentleman, he (the Chairman) admitted that it seemed a case of *current caput*, and was bound to say that he accepted the terms. At last Mr. Fowler, who came to the directors with credentials, was selected. A cypher was given to him by which to communicate his first impressions, so that no time should be lost. Mr. Fowler sent over a cypher, which more than confirmed his instructions. It was submitted and explained to the shareholders, who—and not the directors—took upon themselves to approve the appointment of Mr. Fowler and accept the property. A long written report was subsequently received from Mr. Fowler, which fully confirmed all the statements made by Mr. Tildon, and stated that the value of the ore already exposed was 644,000, sterling, so that it appeared a very good purchase for 65,000. The property was bought solely upon the report of Mr. Fowler, because he positively stated that the ore exposed was worth 644,000.

Mr. Fowler was afterwards appointed superintendent, and at the same time consented to take half of his services, which he (the Chairman) believed to be one great fault in connection with foreign mining companies. So satisfied were the directors as to the results about to be realised that they voluntarily agreed not to accept any fees until after 20 per cent. had been paid in dividends. If this man (Fowler) had told them that he could only see certain indications of a mine, they would not only have purchased the property and saved the deposit money, but they would have had the satisfaction of knowing that they had been dealing with a honest man. When they found that this so-called large body of rich galena turned out to be nothing but iron pyrites, the directors wrote to Mr. Tildon asking him whether, under the circumstances, he could not do something for the shareholders to redeem a very serious loss. He (the Chairman) was very sorry to say that Mr. Tildon's reply was that he sold the property on certain representations, confirmed by a party selected by themselves, and that the purchase had been completed solely upon the report of that person; that a bargain was a bargain, and that had the property turned out a very wonderful one the shareholders would not have given him an increased purchase money. He (the Chairman) believed the directors had done their utmost, but it seemed an unsatisfactory thing for any body of gentlemen to undertake the duties of directors in this country unless they had somebody on the other side who would carry out instructions. The present position of the company was this—there were the debenture holders, who held the first charge upon the property, who had appointed a committee to look after their own interests; but it became a question what was to be done for the shareholders. While this question was being discussed a notice appeared for an application to wind up the company. They had no money, *ex nihilo nihil fit*, so he did not see what advantage liquidation was to gain. As to the future, they possessed good smelting works, and he believed also there was a vast body of ore under the level of the shaft, but it could not be got at without the expenditure of capital. It seemed the only thing they could do was to wind up the company and out of the debris endeavour to establish something which may ultimately turn to their advantage. There were gentlemen who had put large sums of money into the company; for instance, Col. Stanford had put in 12,000, and others 5000, or 6000, to whom it became a question as to what was to be done. He had conferred with one of the largest shareholders, who was perfectly prepared to throw in some 10 or 12 other mines without any charge whatever. It was, therefore, proposed to reconstruct the Saturn Company and to amalgamate it with another company. The capital would be 100,000, in shares; the reconstructed company would give the Saturn shareholders in exchange for their present (75,000) shares 37,500, worth of shares, equal to 50 per cent. of their present holding. It was further proposed that the bondholders, now receiving 15, should accept 12 per cent., and in consideration for the concession should have a bonus of 10 to 12 per cent. in the shape of paid-up shares in the reconstructed company. They had no doubt all the debenture holders would consent to the proposition; indeed, a considerable proportion had already done so. A similar proposition would then be made to other companies, the result being that they would have 14 mines instead of two, five furnaces, and a very complete smelting establishment. One of these mining claims was turning out satisfactorily, and if only one should prove successful the shareholders would have no cause to regret that they had assisted in the reconstruction of the company. An extension of the debenture power from 20,000, to 30,000, would be solicited, and, unless those interested came forward and gave a little assistance, it was proposed to ask them to take debentures of this new issue at 12 per cent.; and for every 200, debenture of the new company they would give 300, of ordinary shares. It would be monstrous if, having such smelting furnaces in the very heart of the heart of the district, which must eventually become the Swansea of Utah, they were to succumb simply because they had not the first instance succeeded. He then moved the resolution embodied in the notice.

Mr. BUNNETT seconded the proposition, which was put and carried unanimously. Mr. DODGALL proposed, and Mr. CADOGAN seconded, a proposition appointing Dr. Bishop liquidator, which was put and carried unanimously. A vote of thanks to the Chairman and directors closed the proceedings.

## FLINTSHIRE LEAD MINING COMPANY.

The annual general meeting of shareholders was held at Manchester, on Wednesday, when the reports of the directors and agents were submitted and approved.

The directors reported that the complete success of the pumping machinery, it having actually drained the shaft in 24 hours, is a matter of congratulation to all concerned. They now confidently rely upon placing the mine in a position to pay dividends at an early period. The directors have to lament the loss of their late Chairman, Mr. William Noble, who devoted himself with great energy to planning the works now achieving such satisfactory results. The vacancy thus caused has been filled by the election of Mr. George Appleby, and Messrs. Hoyle and Drinkwater have been added to the board.

Capt. Thomas Miners reports that the shaft has been drained to the bottom, and properly secured throughout. The water now draining into the shaft is very little, scarcely requiring three strokes per minute with one lift. When they reach the time rock it will, doubtless, increase, and they will then require the double pumping work; but there is no doubt that the machinery is of sufficient power to do the work required, as everything is most substantially constructed. The winding engine has been sent from the machinists, and part has arrived. He thinks it will take them about three weeks from this time to fix it. They will then commence sinking the shaft; after which (if their progress be favourable) it may take about six months to get to mineral bearing ground. He estimates the amount required to carry out this work at 26000; but this, of course, will depend entirely on the character of the ground they may have to contend with. His estimate may be exceeded, or it may require less capital. The sett is very extensive, having large tracts of undeveloped ground, and in one of the richest lead districts in the kingdom, being east of and adjoining the Mues-y-Sydn Mine, which yielded immense profits. Looking at the fact that the adjoining mines have yielded such riches, and at the great returns from the shallow diggings on this

flat, that you catch it deeper, and have such a large space of undeveloped ground, he considers this to be a most excellent property.

Capt. Walter Eddy considers Capt. Miners' estimate for doing the work mentioned for 26000, allowing for contingencies, to be quite as much as will be required. From the richness of the flat on the rise of the new shaft, under the road running between Homewell and Pwllwael, there is every reason to infer that it will produce equally as good, or even better, than the present workings; and as this is on the deep of all former workings, and nearer reported veins; and it has almost invariably been found that lead becomes stronger as it gets closer to the coal measures. By driving in the flat, besides the discoveries made and the ore raised from it, there is the advantage of proving the different lodes that run through the whole sett, of one or more of which lodes, in my opinion, the flat is merely the top diverted from its usual nearly perpendicular position to the same nearly horizontal one as the strata which enclose it or them.

WHEAL OWLES.—At a meeting, held on the mine on Jan. 9, the accounts for 12 weeks to Nov. 8 showed a debit balance of 16247.3s. 1d. Work performed during the quarter:—89 fms. 4 ft. driven in levels; 49 fms. 5 ft. 5 in. sunk in shafts and winzes; 44 paces stopping for tin on tutwork, and 14 pitches working on tribute. (They have 30 tons of tin unsold.)

EAST POOL.—At the two-monthly meeting, on Monday, Mr. R. R. Broad presiding, the accounts presented were:—To labour cost for two months ending October, 27000; merchants' bills, 17000; bankers' charges, 154; lords' dues, 173; total costs, 47277. Credits—Copper ore sold, 9300; tin sold, 36014; arsenic, 8007; wolfram, &c., 104; total credits, 52355, showing a profit on the two months' working of 5077. Capt. Garby explained that the bankers' charges were incurred when they were keeping back their tin with the hope of an increase in price, and these charges would not be so heavy in the future. It was resolved, "That the East Pool committee be empowered to enter into arrangements with the committee and managers of Wheal Agar for settling, by means of arbitration, the question of pumping charges now and for some time past existing between the two mines, as well as all other matters connected therewith; and authority is also given to confirm the result when the award is completed and rendered." In answer to an enquiry of Mr. Martin, Capt. Hosking replied that the 170 and 180 east were the two best points for tin, and the rise in the back of the 180, when communicated with the level above, would greatly facilitate the returns, and what was important in connection with it was that it was almost entirely free from wolfram. The manager and agents, Capt. Garby, Hosking, and Maynard, reported on the mine.

MARKET VALLEY.—At the meeting, on Wednesday (Mr. W. Fawcett in the chair), the accounts for the three months to date showed a debit balance of 12207.2s. 4d., and a balance of liabilities over assets of 5507.15s. 1d. A call of 2s. per share was made. Capt. Secombe, Stenlake, and Reaun urged the sinking of Salisbury shaft, prosecuting where they anticipate an improvement at the 150 ft. level. It was resolved that in making a call of 2s. this day, for the purpose of sinking Salisbury shaft and other exploratory operations, the adventurers have acted in the hope and expectation that the lode will at once consent to a reduction of the dues as from July last by one-half, until the lode is out in the 150. The secretary was instructed to communicate the resolutions to the lords without delay, and to request the favour of an early reply, and in case such reply be in the negative the directors are hereby requested to convene a special meeting of the adventurers to consider what course shall be taken.

CARN CAMBORNE.—At the meeting, on Wednesday (Mr. A. H. Cockett in the chair), the accounts for the three months to date showed a debit balance of 5867.1s. 4d., and a balance of liabilities over assets of 5197.1s. 7d. A call of 2s. per share was made. Capt. G. Rowe and W. Penberthy reported that for the present they think it most advisable to discontinue the tin-dressing stuff, and store up the tin stone until they have a sufficient quantity to operate on to a better advantage, and for the time being confine their operations to working upon the lode as before, and making marketable the copper ore. It is rather difficult to describe the quantity of ore they may obtain in the coming three months, although they may fairly calculate on an increase, and the monthly cost not to exceed the present, while they are cautiously feeling their way with all possible economy, and fortunately in the deepest point of the mine, through a fine course of ore, which is showing strong indications of continuance and improvement both in depth and length, which may lead in a very brief period to profitable results, and open out a valuable property sufficient to warrant the required operations in bringing down the engine-shaft, and place the future working of the mine in a proper and systematic position.

EAST GUNNISLAKE AND SOUTH BEDFORD.—At the meeting on Tuesday (Mr. James Dennis in the chair), the accounts for the three months showed a credit balance of 297.3s. 4d., and a balance of liabilities over the assets of 12207.2s. 4d. A call of 2s. per share was made. Capt. James Hogg reported upon the operations in the mine. Seeing there is a cross-course about 5 fms. 3 ft. in advance of the 54 ft. level end, and also the junction of granite and killas a little further west, he is led to believe that their prospects in that direction are very good, therefore he thinks it prudent to continue the driving of the 54 end with all possible speed.

SOUTH CARN BREA.—At the meeting, on Monday, the accounts, for four months' costs (to Dec. 19) against three months' returns, showed a debit balance of 4067.19s. 4d. Captains W. Rich and James Knowlton reported upon the various points of operation. The sinking of the engine-shaft has been somewhat retarded since the last general meeting, as they had to put in new main-roads, bearers and cistern, and fix new plunger-lift in the 150 ft. level; this work has now been done, and the shaft is nearly 11 fms. below the 150 ft. level. In the last few feet sunk the lode has considerably improved, now yielding fine rocks of copper, and the ground very much easier for sinking; this sudden change in the ground, and the appearance of the lode generally, looks as if they are nearly down on a new and good deposit of copper, quite apart from that seen east of shaft in the 130.

[For remainder of Meetings see to-day's Journal.]

CLAIM FOR INSPECTION OF WELSH MINES.—This was an action which had been commenced in the Court of Exchequer of Pleas, but referred by Master M. Johnson for trial in the Liverpool County Court, in which Mr. James Nancarrow, merchant (of the firm of Messrs. Wakem, Waugh, and Co.), 31, James-street, sought to recover from Mr. William J. Sennett, of 66, Tavistock Crescent, Westbourne Park, London, the sum of 200, 15s., for inspecting and reporting upon the mines in Wales. Mr. Sennett, barrister (instructed by Messrs. Anderson, Collins, and Robinson), appeared for the plaintiff, and Mr. Lowe for the defendant. Evidence was given by the plaintiff to show that some time ago he was instructed by the defendant to inspect and report upon the Comorog and Blaen-y-Glyn Mines, near Llanfyllin, and he made three journeys for this special purpose. He sent in his reports to Mr. Sennett, who expressed himself as thoroughly satisfied with them, but when the bill was sent in he declined to pay the 200, 15s., which included the costs of inspection and reports, travelling expenses, &c.—In cross examination by Mr. Lowe, plaintiff said he supposed the mines were still being worked. He had not heard until that morning that the mines had been incorporated into a company, but he only knew Mr. Sennett through the whole transaction. Mr. Lowe said that after the evidence of the plaintiff he could not resist the claim. Judgment (Mr. Lowe) had done his duty for his client, and there the matter must end.—Judgment was then given for the plaintiff for the full amount claimed.

## THE COMSTOCK MINES.

The Crown Point Mining Company have declared a dividend of \$3 per share. This is the last dividend for the year. The history of the mine since the resumption of dividends is similar to that of Belcher, referred to last week. The recent large and rich bodies of ore in both mines were developed about the same time. The Crown Point resumed the payment of dividends in June, 1871, for the first time since September, 1869. They have since paid monthly dividends of \$2.00 each were paid, making a total of \$450,000. Dividends were then suspended for three months, and commenced again in January, 1872, simultaneously with the resumption of dividends by the Belcher Mine. During the past two years the dividends disbursed by the Crown Point Mine have been—in 1872, \$1,860,000, and in 1873, \$5,100,000; making a total of \$6,960,000 paid in dividends to stockholders in two years. During the same period the Belcher Mine paid 21 dividends of \$3,946,000, equal to \$86 per share, against \$80 per share for Crown Point. Adding the dividends disbursed by Crown Point in 1871, we have the following amounts paid to stockholders since the resumption of dividends based on the operations in the lower levels of these two notable mines:—Belcher, \$86 per share; amount, \$8,946,000. Crown Point, \$74.40; amount, \$7,440,000; total, 16,386,000. We doubt whether any other two mines in the world can present a similar record.

The Belcher Mining Company have just declared a dividend of \$5 per share. This is the last dividend of the company for the year. The mine was for years unproductive. The levels from which the ore is now taken were first opened in 1871, and the payment of dividends from the product of the same was commenced in January, 1872. Since then the disbursements to stockholders have been—in 1872, \$2,184,000; and in 1873, \$6,762,000. Such a liberal disbursement of dividends to stockholders in two years is unprecedented in the annals of any mine in the world. The nine dividends in 1872 were equal to \$24 per share, while the twelve dividends for the same year are equal to \$85 per share; amount, \$8,946,000. The gross amount of the dividends paid in the past two years is fully up to the average price of the stock for the year, thus returning shareholders about 100 per cent. interest, without depreciating the principal.—*Evening Standard*.

THE HYDRAULIC MINES OF CALIFORNIA.—PROSPECTS OF THE COMING WATER SEASON.—Everything in a mining community like ours depends upon the success of the mining interests. When the prospects of the miners are bright everybody is jubilant, and that is the case just now. Never before did the rainy season open better than the present one does, and never before were our mines in better condition for getting off ground and saving gold than this year. Many improvements have been made since last season in the way of mining apparatus, and but few claims are now without an ample supply of iron hydraulic pipe and Little Giant, Dictator, Hydraulic Chief, or other improved machinery. All the claims which were worked last year will be run on an increased scale this winter, and many new ones, with flattering prospects, will be opened. Our white mining population has been considerably increased since last spring by an influx of practical miners from Nevada, Placer, and neighbouring counties, but there will be plenty of employment for all. With the recent improvements double the work can be done, under other like circumstances, than in former years. An extraordinary good mining season is certainly foreshadowed in the recent storm, and we confidently expect to be able next spring to report the present season as the most prosperous one Trinity county has ever experienced.—*Trinity Mining Journal*.

BREAKFAST—EPPS'S COCOA—GRATEFUL AND COMFORTING.—"By a thorough knowledge of the natural laws which govern the operations of digestion and nutrition, and by a careful application of the fine properties of well-selected cocoa, Mr. Epps has provided our breakfast tables with a delicately flavoured beverage which may save us many heavy doctors' bills."—*Civil Service Gazette*. Made simply with boiling water or milk. Each packet is labelled—"JAMES EPPS & CO., Homoeopathic Chemists, London."

MANUFACTURE OF COCOA.—"We will now give an account of the process adopted by Messrs. James Epps and Co., manufacturers of dietetic articles, at their works in the Euston-road, London."—See article in *Cassell's Household Guide*.



## FOREIGN MINING AND METALLURGY.

At Paris quotations for copper have been generally well maintained, but the transactions effected have been of no great importance. Chilean in bars has made 89 $\frac{1}{2}$ ¢; ditto in ingots, 94 $\frac{1}{2}$ ¢; tough English, 93 $\frac{1}{2}$ ¢; and pure Corocoro minerals, 91 $\frac{1}{2}$ ¢ per ton. Copper has been also pretty well maintained at Marseilles; Spanish in plates has made 86 $\frac{1}{2}$ ¢ per ton. The transactions concluded in copper in Germany have been unimportant; prices have, nevertheless, been generally firmly maintained. The next great sale of tin in Holland will take place Jan. 29, and it will comprise 7600 blocks of Banca warehoused at Rotterdam, and 13,200 blocks warehoused at Amsterdam. Meanwhile tin has been in rather more request in Holland; disposable Banca has been dealt in at 72 fls. to 73 fls. At Paris there have been few transactions in tin; prices have, nevertheless, been firmly maintained; Banca, delivered at Havre or Paris, has made 129 $\frac{1}{2}$ ¢; Straits ditto, 129 $\frac{1}{2}$ ¢; and English, delivered at Havre or Rouen, 124 $\frac{1}{2}$ ¢ per ton. Tin has been quiet and without much business upon the Marseilles market. French lead, delivered at Paris, has made 24 $\frac{1}{2}$ ¢ per ton in that capital; Spanish, delivered at Havre, 24 $\frac{1}{2}$ ¢ per ton; and Belgian and German, delivered at Paris, 24 $\frac{1}{2}$ ¢, 4 $\frac{1}{2}$ ¢ per ton. The German lead markets have been generally firm. There has been a slight feebleness in zinc at Paris; Silesian zinc, delivered at Havre, has made 27 $\frac{1}{2}$ ¢; other good marks, ditto, 27 $\frac{1}{2}$ ¢, 4 $\frac{1}{2}$ ¢ per ton; rolled Vieille Montagne zinc has been quoted at 34 $\frac{1}{2}$ ¢ per ton. In Germany zinc quotations have been generally firmly maintained.

Under the double influence of a reduction in the price of combustible and the imperious requirements of foreign consumption there has been a slight revival in affairs in the Belgian iron trade. Transactions do not present, it must be confessed, any very great importance, but they are sufficient to indicate that a sensible amelioration in the situation will not be long in manifesting itself. Orders are coming to hand from Germany, and English purchases of plates and tyres have also been made. France has also given out some orders for specialties. It is especially to the Liège basin that foreign orders have been addressed, the important district of which Charleroi is the centre being, to some extent, passed over. Belgian makers of railway plant complain of a great want of work. A deputation from this interest have even waited upon the Belgian Minister of Public Works to ask that official to put in immediate adjudication a number of the new trucks and carriages of which the Belgian State lines will this year stand in need. The Minister of Public Works promised the deputation that he would consult with the Minister of Finance, and see what could be done in the matter. It was recently announced that some Belgian mechanical firms had sent in the lowest tenders at an adjudication for plant in connection with the Royal Sarrebruck Railway. The information was correct, but it appears that, notwithstanding the advantageous terms offered, the Prussians preferred to protect their national industry, so that the Belgian industrialists who tendered on the occasion will only gain a sterile victory. The course pursued by the Prussian authorities has naturally provoked adverse criticism in the Belgian press. An adjudication which has just taken place for the delivery to the Belgian State Railways in four lots of 2524 tons of steel rails, with fish-plates, &c., brought together tenders ranging from 16 $\frac{1}{2}$ ¢, 4 $\frac{1}{2}$ ¢, to 17 $\frac{1}{2}$ ¢, 16 $\frac{1}{2}$ ¢ per ton. Messrs. Shaw and Thomson, of London, tendered at 17 $\frac{1}{2}$ ¢, 2 $\frac{1}{2}$ ¢, 6 $\frac{1}{2}$ ¢ per ton; some German firms also sent in tenders. The exports of pig and iron from Belgium in October have just been officially returned at 15,282 tons, or 1802 tons less than in October, 1872, and 20,170 tons less than in October, 1871. During the first ten months of 1872 the exports of iron of all descriptions from Belgium were 51,767 tons less than during the corresponding period of 1872. The exports of minerals and hématis from Belgium in October were 11,198 tons. The imports of iron into Belgium in October were 7914 tons; pig was imported to the extent of 6960 tons. The quantity of minerals introduced into Belgium in October was 58,157 tons—a total differing but slightly from the imports of the corresponding months of 1871 and 1872. The diminution in the value of the pig and iron exported from Belgium in the first ten months of last year, as compared with the corresponding period of 1872, was 240,000 $\frac{1}{2}$  in round figures.

The intelligence received from the various French centres of metallurgical industry is of a more reassuring character. There appears to be a general impression that the period of activity which has so long prevailed will shortly terminate. A cluster of various circumstances have rendered 1873 a not very prosperous year for metallurgical industry. The course of political events, the unfavourable financial situation, the high price of coal, the reaction which invariably follows a year of exceptional production and profit, have all in turn, and even simultaneously, weighed upon French metallurgical industry, not only in France but in all iron-producing countries. All these disturbing causes have now, however, to some extent, moderated their adverse influence, and there is, consequently, what appears to be a well-founded hope of a revival in affairs. It is also thought that large clients will find it impossible to longer postpone the execution of their orders, as they will see that the price of iron has probably attained its minimum for some time to come. On the whole, then, there appears to be an impression that the year which has just commenced will be a more favourable one for French metallurgy than that which has just elapsed. The price of pig and iron has meanwhile not varied in France. The Paris market has continued extremely quiet. The French Railway Plant Company has been paying an interim dividend for 1873-4 at the rate of 12 $\frac{1}{2}$ ¢ per share.

There is little news as to the French Coal Trade. The Paris market has languished, and continued mild weather has increased the dullness in affairs. Coal merchants are little satisfied with the aspect of things, as there appears a probability that they will not be able to dispose without loss of the supplies which they laid in in the autumn. The iteration of this apprehension from month to month, of course, aggravates the effects of it. Coal quotations in the North of France are tending downwards; coalowners appear indisposed to formally publish reduced tariffs, but they are making very serious concessions to clients, in order to keep their connections together. They are not successful, however, in every case, as German and English coal is growing in favour. For the present, too, there is no great demand, as the supplies laid in last summer were much more considerable than usual. The general tendency to feebleness remains, upon the whole, unshaken and undisturbed.

There has been comparatively little business passing in coal in Belgium. Some contracts have been renewed, but for very short periods, and only to provide for current requirements. Purchasers have declined important concessions offered to them, as they prefer not to engage themselves too long beforehand. The fall which has taken place in prices has, for the rest, been officially recognised, and the trade has consented to divulge to the world what everyone knew two months since; but further tariff reductions have been made, and the downward movement has assumed quite remarkable proportions. Coking coal has been dealt in in the Charleroi basin at 16s. to 16s. 10d. per ton, and coke at 24s. 10d. to 25s. 8d. per ton. At Liège the fall in coking coal and coke has been even more severe, as there are larger stocks in that basin than in other parts of Belgium. The current price for coal in the Liège district is 16s. per ton, and one company is even mentioned which has done business at 14s. 4d. per ton. As regards descriptions of coal suitable for rolling-mills, they have been dealt in upon very variable conditions, according to quality, and according to the importance of contracts; prices range between 16s. and 19s. 4d. per ton, but from the last-mentioned price there are many concessions. The demand for coal for domestic purposes in Belgium is just now extremely feeble. For the rest, upon the whole, the coal trade has been extremely inactive in Belgium; the demand has fallen off almost from day to day, and the production has been reduced, in order that stocks may not accumulate. Wages are being lowered without much difficulty, and many coalowners who were complaining a few weeks since of want of coalminers are now embarrassed by having too many of them. It appears from official returns that in October 67,000 tons of coal were imported into Belgium, of which 25,000 tons came from Germany and 34,000 tons from England. The imports of October, 1872, did not exceed 21,000 tons. During the first ten months of 1873 the aggregate imports of coal into Belgium attained

the very considerable total of 532,000 tons, as compared with 160,000 tons in the corresponding period of 1872. The exports of coal from Belgium last year presented, on the contrary, a sensible diminution; thus they amounted in October to only 361,000 tons, while in October, 1872, they were 410,000 tons. The aggregate exports of the first 10 months of last year were 3,582,000 tons, against 3,911,000 tons in the corresponding period of 1872. The difference of 330,000 tons here indicated, coupled with the increase of 372,000 tons in the imports, represents a total of 702,000 tons to the detriment of Belgian coalowners. The exports of coke from Belgium in the first 10 months of last year presented a slight augmentation, having been 701,000 tons, against 632,000 tons in the corresponding period of 1872.

## GAULEY-KANAWHA COAL COMPANY.

Extracts of a letter from General IMBODEN, general superintendent Gauley-Kanawha Coal Company to Prof. ANSTED, F.R.S., dated Richmond, Dec. 28, 1873:—

Colonel Imboden reports the manager Straughan as a most excellent man—skilful, industrious, and intelligent. He has penetrated some feet beyond the Cap rock, and is getting out coal of the very finest quality. A most important discovery was made in the seam on last Friday. When first opened I suspected they were not on the real floor, but working on the top of a hard slate parting, and the day before I left I told Taylor to dig into the floor. He did so only a few inches, and laughed at me, saying it was the solid rock. On Friday last Colonel Imboden went into the mine to measure for the timber he is engaged in preparing, when he told Straughan there was something wrong with the vein, as the clear coal was only 6' 3" when it ought to be more. After the colonel left Straughan began to cut out a footing for his timbers, when he cut into hard splinty coal at a few inches, thus discovering that what he had regarded as a floor was only a parting; and on driving down he found under his feet 4' 6" of coal and parting. He has gone back to the beginning of the opening to carry up this important member of the seam to his heading, and will have instead of 6 $\frac{1}{2}$  or 7 ft. of seam, full 10 ft., thus giving us a clear headway in coal high enough to run in a locomotive with a train of cars. This new discovery will improve our grade by lowering over 4 ft. . . . Straughan is delighted with the coal, and finds one stratum or belt of the seam containing so much splint that the probabilities are that before we proceed 100 ft. further we shall have a large proportion of the seam genuine splint, and the rest as fine bituminous as any in the entire district. The Gauley lumbering goes on well. In about 18 days work over 1400 logs have been got out, and several thousand staves made, besides cutting and sawing a great deal of white oak ready to split after New Year.

The manager reports his ability to get out from 2000 to 2500 logs per month with 25 hands, and adequate teams to take them half-a-mile to the river. We find the market at Cincinnati for logs very active, at prices at which we can net over \$1 per log of all kinds. He has already a good many Walnut logs cut, and believes he will have 500 to 1000 of these ready for shipment by May.

## FOREIGN MINES.

EMMA.—Telegram: Emma produced last week 90 tons, 300 per ton; 10 tons, 1000 per ton.

DON PEDRO NORTH DEL REY.—Telegram from Lisbon: Produce for November, 5053 oits.; weighted to Dec. 18, 1873 oits.

EBERHARDT AND AURORA.—Telegram from Capt. F. Drake:—

"Number tons milled for month of December, 1133, producing 7484 $\frac{1}{2}$ ¢ profit, 18004 $\frac{1}{2}$ ¢."

RICHMOND CONSOLIDATED.—Cablegram from the mine at Eureka, Nevada:—

"Week's run, \$34,000; two furnaces; Rossiter incline down 300 feet; a splendid ore."

COLORADO TERRIBLE LOSE.—Extracts from agent's advices dated Dec. 24: Weather very favourable for our work. The 38th shipment, after crushing and weighing, I find requires about 3000 lbs. to complete it; no time shall be lost in getting it away.—Inside of Mine: Fourth Level Drift: This working is in very hard rock, the heading is still full of veins of mineral. The Fifth Level Drift is in hard ground, the vein is much scattered, will make good second, but little first-class ore. The Sixth Level Drift west is in good ground, much softer than the upper drifts; vein about 6 in. wide, the appearance indicates it will soon make into solid ore. The east working is about the same as west working. The Fifth Level 8000, No. 1 vein is increased to 8 in. wide, the greater portion will have to go for second class. No. 4 stope still the same, producing good second class but little first-class ore. Ore delivery, 7 tons, 1200 lbs. of second-class to Stewart. Ore sales, 25 tons 1542 lbs. to Stewart; value, \$3874.85.

MINERAL HILL (Silver).—Extract from a letter received from Mr. Oakes, the superintendent at the mine, under date the 22 ult.: The ore raised during the week is 40 tons, of an average grade of \$50 per ton. The surface shaft is now down 100 feet, and have not yet struck the bed rock. The weather has been very severe, which has somewhat impeded the work on the hill; we have in consequence put two men in the Taylor tunnel to continue the explorations in the north drift, on east side of the quartz ledge, and I hope we may be in a position to keep them there for some time. The prospecting in this tunnel must be regulated entirely by the monthly workings, and men will be put on and off as the state of our finances will allow, so as not to show a loss in the monthly accounts.

ELBORADO (Nova Scotia, Gold).—Captain Sprague, Dec. 26: I stated in my last that we had desisted the Plough shaft 12 ft. the quartz from this 43 tons gave 2 dwts. per ton only. We are now stopping eastward from shaft. It is to be hoped the next clear up at the end of the month will give a better result. On the Hattie vein there are three men at work on tribute. The weather is very cold. Yours of the 2nd came duly to hand; in reply I beg to say that we have 150 ft. in length on the Major Norton vein. I think by sinking the shaft 30 ft. deeper we should come on the gold streak. The Kattie vein is from 1 to 3 in. wide, the quartz is rich; it forms part of the Mitchell vein; it is best near the surface, and gets poor in depth, as estimate can be given of the quantity of quartz it contains, as it is only opened to a very limited extent. The quartz from the north area is now being stamped, and I will give the result in my next.

JAVALL.—Capt. Shins, Dec. 6: A revolution has broken out in the country, and most of the native workmen have been pressed; those left (for which I have the security of the Military Governor) together with the men sent out by the company, have been in stamps going 25 days, crushing 1080 tons of quartz, yielding 30 dwts. of gold, at an average of 5 dwts. 14 grs. The expenditure was 660 $\frac{1}{2}$  5s. 3d.; value of remittance, 790 $\frac{1}{2}$ ¢; leaving a profit of 123 $\frac{1}{2}$  14s. 9d.

CHICAGO.—J. H. Latoy, Dec. 27: In accordance with request I write you. The furnace is doing very well, and I confidently expect a good return for the month of December. As soon as results have been ascertained by the accountant they will, as usual, be called to you. I will, however, mail you the furnace report immediately after the 31st. We are just now labouring under difficulties incident to a more than usually inclement season. The road in the canyon is very bad, both slippery and rocky. The wisdom of the company owning teams is fully manifest now; we could not run without them, and freight would be very high. There is very little ore except Chicago now coming out. Everything at the works is going on nicely. We have no trouble whatever with the indispensable article—water, nor freezing up, clogging, or bursting pipes—valves, or service-cocks so far, nor do I think we will have any. There is plenty of ore both at the upper and lower terminus of the ropeway, and the mine never did better than now, except in the matter of grade, which latterly has been lower. It is improving though now, and it is hoped will continue to do so.

Dec. 28: The furnace is running very well, and you will have a good report soon after Dec. 31. The furnace hands want to stop for Christmas or New Year, but I say emphatically "No; we will not 'shut down' until we are forced to."

Jan. 15: The following telegram has been received from Mr. E. J. Dowlen, Salt Lake City:—

"We have run our furnace 31 days; net profits \$10,000."

RICA GOLD WASHING.—The directors have received advices from Mr. C. R. Clarke, dated Nov. 28, of which the following is an extract:—The day before yesterday I returned from Rica, and left everything going on all right; during the heavy rains we had considerable trouble on ditch; at one place there came a slide that carried away about 60 ft. of ditch, which had to be repaired by putting in a flume; we are now working from 5 to 8 hours a day. Our gravel still looks well, and the machine whilst at work does well. My intention was to clean up at the end of the month, but there was so much time lost on ditch that I shall wait until the middle of December.

MALPASO GOLD WASHING.—The directors have received a telegram advising a remittance of \$1500, being a clean up after a run of 470 hours, as against 560 hours of the previous run. They have received advices from their superintendent, Mr. C. R. Clarke, dated Nov. 28, of which the following is an extract:—I wrote you last on the 18th inst. On the evening of the 20th, just as we were changing shifts, the machine burst, caused by a flaw in the iron. We lost that night and half the next day, when we got the old machine on, and all right again. I suppose we shall have to send for the parts that are broken, so as to have an extra machine on hand. On Monday and Tuesday of this week we added 4 $\frac{1}{2}$ ¢ an extra machine on hand. Since last clean up we have advanced our bank about 30 ft., and if the water does not fail us we will continue to do as well. The hard gravel is rising rapidly, and I think before we reach the high banks we shall be working the rich gravel below. The waste at present is considerably more than usual, but I think it will not last so. We shall clean up about the 1st, and I am in hopes we shall have water to make another clean up upon Jan. 1.

CHONTALES CONSOLIDATED.—The directors have received advices from Mr. Smedley, dated Dec. 5: Ore crushed during November, 1828 tons; produce, 399 oits. of gold, average 4 $\frac{1}{2}$  dwts. per ton; value, 1118 $\frac{1}{2}$ ¢; cost for the month, 664 $\frac{1}{2}$ ¢, leaving a net profit of 454 $\frac{1}{2}$ ¢. The above cost includes 89¢ charged to construction account. There is no change to report in connection with the mines. The tramway to Estrella Mine will be completed in a few days. The heavy spur wheel and pinion had been delivered at the mine. The health of the establishment continues good.—San Sebastian: On account of the difficulty in keeping the natives at work during the last fortnight we have not opened so much ground as I expected. In the No. 3 level the lode continues large and poor. In No. 2 east, also in No. 1, it is payable, the latter having improved during the last few days. The cross-cut

to intersect the south lode, under the old workings, is being driven, and I hope to strike the quartz during the present month.—St. Domingo: There is no change to report in connection with this mine, a very large proportion of the lode is hard rock, which it is necessary to treat with the aid of the stone-breaker, the average yield is about 3 $\frac{1}{2}$  dwts. per ton. I have commenced to open up the east end from No. 3 level, the lode is at present 3 ft. 6 in. wide, and worth about 3 dwts. per ton.—San Benito East: We have not yet struck the lode in the cross-cut, which continues very hard, but I think there is little doubt we shall do so during the present month.—Estrella: I have commenced to drive the cross-cut, but on account of the scarcity of labour have been compelled to suspend operations.—Tramways: The Estrella tramway will be completed in a few days.—Machinery: The heavy spur-wheel and pinion has been delivered at the mines. We are at present engaged in bringing a large wheel from Paven, which will, I trust, be the last heavy cost we shall have in the shape of freight of machinery.

I. X. L. (Gold and Silver).—L. Chalmers, Dec. 22: Received herewith statement of accounts for November. With the exception of shovelling snow to get supplies to the mine, little has been done last week. I have some rich ore at the mine and at the custom mill.

EXCHEQUER (Gold and Silver).—Lewis Chalmers, Dec. 17: I have over 100 tons of good ore in the mill, and about 50 or 40 still at the mine, which I am afraid I will be unable to get to the mill this winter over snow 8 ft. deep. I have been vainly attempting to get mill hands to run the above through. Had I succeeded in getting them you should have had the result in bullion telegraphed—more satisfactory than manager's valuations. I do not, however, despair of getting the run made next week, or the one following. Since Monday it has snowed incessantly, making the 5 ft. of snow we had at the mine 8 ft., and effectually stopping hauling, though when it abates I must try and open a road to get up provisions for the men and supplies for the mine. Independent of the bad state of the intercommunication, the present produce of the mine will not keep the mill running regularly, and to run spasmodically—for reasons given—is to throw money away. The prudent course to be pursued is what I have previously advised. Sink the engine shaft at any rate to the Acaia level, run your Acaia tunnel, and keep on running the north drift from the 100. When at your Acaia level run drifts north and south, and stop all you can. I think these operations would enable you to run your mill steadily in spring. In looking out such hopes and expectations to you, I am justified by the appearance of the mine, the widening and improved character of the ore in depth, and the true fissure stamp on the lode; and I am not alone in my good opinion of your mines. Professor Raymond is more sceptical than sanguine, and his favourable opinion is worth something. It looks more settled to-day.

Dec. 22: The amalgamator I expected to get to run the mill is laid up with erysipelas. It is almost impossible to get a good man to come up to this snowy region for a short job, and when you do you have to pay high wages and travelling expenses both ways. However, I must get a man somehow. I have all the rest of the crew ready. Little was done at the mine last week, but shovelling when it was possible for storm.

SAN PEDRO.—R. M. Kitto, Nov. 15: New Shaft: The water has forked considerably, and is now near down to the bottom of the 150; we are engaged in securing the ground around the pit which was washed out with water in the soft mantos; we hope to be able to resume the driving of the cross-cut in this level in the course of a few days. The wine sinking below the 135, on the north part of Manto, has changed, and is now in the Manto, spotted with ore, but not sufficient to value. A level driving south of this wine, 15 metres below the 135, is without change since my last. A stope in bottom of the 47, or No. 4, has improved, and will produce 3 tons of 25 per cent. ore per fathom; this is all in untried ground both above and below on the western branches.—San Antonio Mine: At a new shaft sinking from surface, by six men, the ground is favourable. They have finished the contract of 200 metres here, and I have given them \$30 per metre for as much as they can sink for the month.—Cuba Mine: A cross-cut driving south of east, to intersect the Mantos, is producing good stones of ore. Santa Helena Mine: In a chillon sinking below the middle level for roadway the ground is hard and poor, but we are obliged to keep work here, as some parties are inclined to give us trouble by denouncing the mine. I am glad to state that we are getting on very well with the work of engine, &c. Mr. Phillips arrived here last Tuesday, and we have commenced to leave in the engine. We have the greatest part of the people employed in getting on the work for the machinery.

Nov. 29: New Shaft: Since my last we drained the water to the 150 and commenced to drive. On the second day we cut a large stream of water; in 24 hours it was again up to the back of levels. It is useless to think of driving it with horse-power; we will endeavour to keep it from rising by working the wine eight hours per day. If I were sure the water would do no damage to the mine I would let it rise, but I am afraid it will bring the shaft together; for that reason I think it will be better to keep it at this point, where it can do no damage. The wine sinking below the 135, north part of manto, is suspended, on account of cutting water; also the level driving south of this wine, 15 metres below this level, is suspended. In a cross-cut at the 88, driving south of west, to intersect the western branches, the ground is favourable. A stope in the bottom of the 47, on the western branches, will produce 3 tons of 25 per cent. ore per fathom.—San Antonio Mine: A new shaft sinking below the surface, by three men, is now down 45-50 metres, ground favourable.—Santa Helena Mine: In a chillon sinking below the middle level, the ground is still hard. I am sorry to state we are not getting on so fast as I could wish with the engine, as we cannot get coals enough to bring up the machinery.

BATTLE MOUNTAIN.—Capt. Rickard, Dec. 26: The 113 ft. drift is still of the same promising character, but produces no ore as yet, it has been driven 100 ft. beyond Pierre's wine, said wine being 455 ft. north of the Virgin shaft. The new shaft sinking below the 113 ft. drift is down 30 ft., and is producing stones of red oxide and green carbonate of copper. The stope north of John's rise, in the back of the 113 level, is yielding some good ore, but the lode is small. The lode in the back of the 73 ft. level has been suspended for the present. The lode in the back of the 155 ft. level, at Lake Superior, is large, the ore being associated with gangue to a great extent.

NEW ROSARIO (Mexico).—M. V. Cumins, Dec. 13: Providencia Mine.—San Manuel Level: This end is improving in quality of ground both for driving and for ore. The last two weeks have been against us for much work. In the first in consequence of the illness and death of Capt. Skewes's brother, and the week there have been three false days.—San Guillermo Level: It is probable that we shall not cut anything of importance in this level until we meet the second shoot made at the Palma shaft. It appears that the first surmise that one shoot of ore extended from the Providencia to the Italiana shaft was incorrect, and unless the shoot from the Palma to the Italiana is all one there must be three separate shoots or deposits of ore. As the distance that separates them is, however, short it is likely that as they extend in depth they will form one unbroken range of ore ground.—San Juan Level: In this upper level 4' appears as if we were approaching the limit of the shoot of ore in a northerly direction, and as it extends further in the bottom, or San Guillermo level, it is probable that the vein of ore above will be found correct.—Rosario Mine.—San Juan Level: The ground here has much improved; the lode never carried very good walls, but now it has a splendid hanging wall, along which, beside the lead, there is some of the pretty spar that we had when the ore was so good in sinking the wine. Strings of lead are coming in all over the end, and there are points all over it for fully 1 $\frac{1}{2}$  yards from the hanging wall. They are not rich, but all contain silver, which is a good sign, as it shows the lode to be alive, and, with the other improvements, leads us to hope that we shall cut something good shortly.—Reduction of the Ore: I have ascertained that the Americans are desirous to purchase the whole of our ores, or to reduce them for us, in their new house at the mill. From this it may be inferred that large supplies are not expected from the Real del Monte Company, who hold so many reduction works of their own, which it is not probable they will throw idle in order to support the new works. An attempt was lately made by some natives to bribe the guard to let them descend into the mine on a Sunday night to break ore, but the guard was true to his employers. I have deemed it right to reward him for his faithfulness.

NEW ZEALAND KAPANGA (Gold).—Capt. J. Thomas, Oct. 21: The progress made with erecting the works have been considerable since my last report by last mail. The winding-engine loading is completed being built to height to receive strong wooden frames, or horses, to carry the winding gear and its connections. The cylinder loading is about half completed, it will be finished in a few days. The frame work forming the engine-house is now finished, which consists of splendid Kauri pine spars, strongly braced and stayed with iron rods, and morticed into the foundation logs; the frame work and stays are built in the concrete masonry, the whole structure forming almost one solid piece. As before mentioned, I have been obliged to construct the engine house and its foundation of wood (no building stone being procurable), and the loading consisting of concrete rubble set on the foundations, to give solidity to the whole structure, which answers exceedingly well. The engine-house will be roofed, weather boarded, and floor inside immediately in readiness for receiving the machinery as soon as it can be placed in position. The engineers are busily engaged fixing the spring beams in the house, and beam stools on both ends for receiving the beam, and getting the slack tackle ready for hoisting the beam in its position; all this work will also be finished by the end of this month. The boiler makers have finished riveting two boilers together, which are now waiting to be put in their places when we are ready to commence to set them. After the masons have finished the cylinder loading, they will start to build in the boilers immediately. I find a brick stack, or chimney, 60 feet in height, will cost, with the present price of bricks, over 2000 $\frac{1}{2}$ ¢; finding I can erect an iron chimney the same height for about 500 $\frac{1}{2}$ ¢, that will answer the purpose quite as well. I have purchased some 3 16th plate-iron, size 6 by 3 feet, for the purpose. I am contracting for riveting these plates together to resemble a steamer's smoke funnel. This iron chimney will be 3 ft. in diameter, and will be stayed to the engine-house, securely and with safety, with little trouble or expense, saving 1500 $\frac{1}{2}$ ¢ on this item. The commencement of summer weather is now with us, and our future progress completing the remainder of the heavy work will still be the same by keeping on the present hands. The smiths, carpenters, masons, sawyers, cutters, and surface labourers, are being pushed ahead with their several works with every dispatch possible by my staff and myself. Our work will be lightened very considerably after next month.

CAPE COPPER.—Returns for November: Ookiep, 675 tons of 32 per cent.; Spectakel, 50 tons of 29 per cent.—Railway: Traffic for four weeks, ending Nov. 29, 469 tons up, and 950 tons down.—Bills of Lading Received: 270 tons of ore per Anglian; 39 tons per European; 195 tons per Syria; 45 tons per Northam.—Arrivals at Port Nolloth: The Laura and Taena with outward cargoes, and to load home (together) about 1000 tons of ore. The former vessel took out the new pumping-engine and machinery, and these had since arrived at the mines.—Arrivals at Swanesa: The Crocydon with 525 tons of ore, the Juliet Daniel with 488 tons of ore.—Sales: By public ticketing, on Dec. 16, 508 tons of ore, and 10 tons of regulus, at 16s. 2d. per unit, realising approximately, ore 13,000 $\frac{1}{2}$ ¢, regulus 450 $\frac{1}{2}$ ¢. On Jan. 6, 297 tons of ore, and 77 tons of regulus, at 16s. 5 $\frac{1}{2}$ ¢ per unit, realising approximately, ore 8220 $\frac{1}{2}$ ¢, regulus 2820 $\frac{1}{2}$ ¢. Put forward for sale, by public ticketing, on Jan. 27, 827 tons of ore and regulus. The Ookiep and Spectakel Mine reports received. The former describes the usual satisfactory progress, the latter is unfavourable. The superintendent writes that since the last report on trial mines, Swanesa has much improved; good ore has lately been met with in the bottom of the shaft there, of which a sample is sent by present mail. Bills of lading are received for 195 tons per Syria, and 45 tons per Northam. The Juliet Daniel, with 488 tons of ore, has arrived at Swanesa. There were sold by public ticketing, on Jan. 6, 297 tons of ore and 77 tons of regulus, at an average of 16s. 5 $\frac{1}{2}$ ¢ per unit, realising approximately copper ore, 8220 $\frac{1}{2}$ ¢, regulus 2820 $\frac{1}{2}$ ¢; 527 tons of ore and regulus have been put forward for sale by public ticketing on Jan. 27.

MENZENBERG.—R. K. Roskilly, Jan. 14: We are pushing on the drive east and west of Dickins's shaft, at which point the ground is somewhat harder. The lode continues very promising.

[For remainder of Foreign Mines, see to-day's Journal.]





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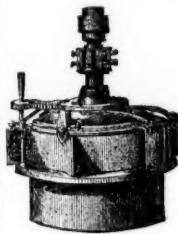
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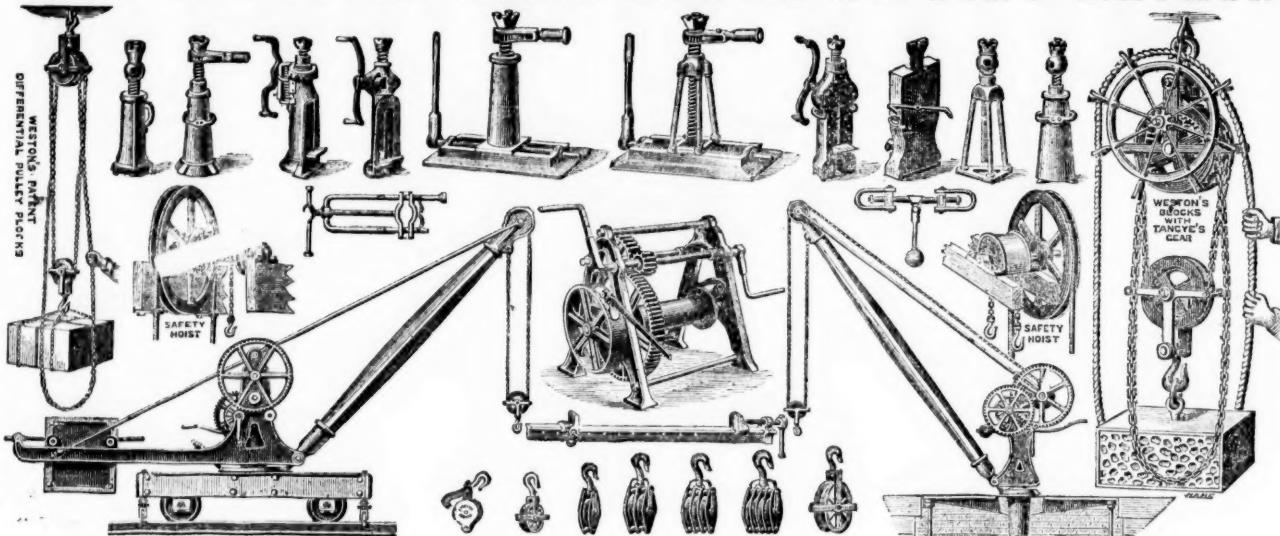
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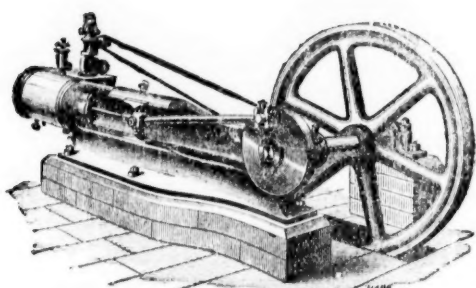


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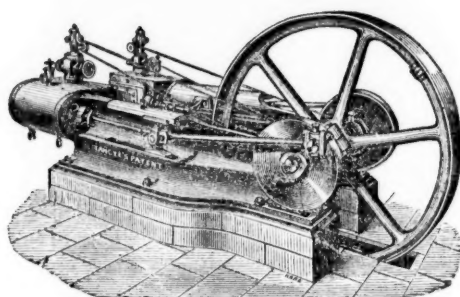
Tangye's Horizontal High-pressure Expansive Steam Engine.—Over 900 sold since introduction in Dec., 1869.

The bed-plate, front cylinder cover, cross-head guides, and plunger-block for crank-shaft bearing, are all cast in one piece, the cylinder with its valve-chest being bolted to the end of the bed. The cross-head slippers and connecting-rod ends are made adjustable, so that any wear can be readily taken up. The fly-wheel, cylinder-end, connecting-rod, and crank-plate are all bright. All the parts are made to Whitworth's Gauges, and the material and workmanship are of the highest class throughout.

### PRICES.

Size.	Indicated H.-P.	Diameter of Cylinder.	Length of Stroke.	Price of Engine.	Feed Pump Extra.	Variable Expansion Extra.	Link Motion Extra.
B	3.8	4	8	£ 32	£ 3	—	—
C	5.9	5	10	£ 38	£ 3	—	—
D	8.6	6	12	£ 46	£ 4	—	—
E	15.0	8	16	£ 70	£ 5	10	20
F	19.4	9	18	£ 90	£ 7	10	20
G	23.9	10	20	£ 115	£ 7	10	20
H	34.5	12	24	£ 135	£ 8	15	22
I	45.0	14	28	£ 160	£ 10	16	25

Prices of Boilers on Application.



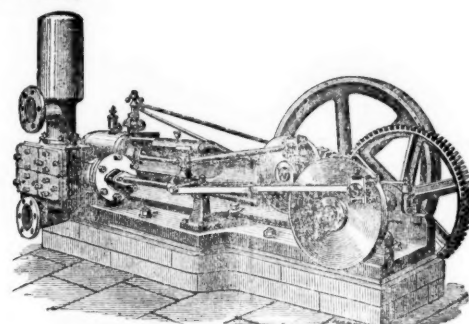
Pair of Tangye's Horizontal High-pressure Expansive Steam Engines.

In design and workmanship these engines are precisely the same as the foregoing, but being made right and left hand, they can be coupled for many purposes with great advantage. The crank-shaft can be made any length, and the fly-wheel replaced by pulleys or drums. Link motion can also be applied, and when so fitted they are eminently adapted for winding from mines.

### PRICES.

Size.	Indicated H.-P.	Diameter of each Cylinder.	Length of Stroke.	Pair of Engines.	Feed Pumps Extra.	Variable Expansion Extra.	Link Motion Extra.
B	7.6	4	8	£ 65	£ 6	—	—
C	11.8	5	10	£ 79	£ 7	—	—
D	17.2	6	12	£ 94	£ 8	20	40
E	30.0	8	16	£ 142	£ 11	24	40
F	38.8	9	18	£ 183	£ 12	26	40
G	47.8	10	20	£ 235	£ 15	28	44
H	69.0	12	24	£ 275	£ 16	30	44
I	90.0	14	28	£ 325	£ 20	32	50

Prices of Boilers on Application.



Tangye's Horizontal High-pressure Expansive Steam Engine, combined with Holman's Double-action Pump.

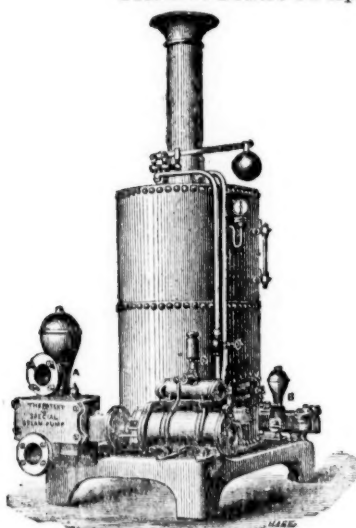
These engines can be used for pumping only, or pumping and driving other machinery simultaneously; or, by the sliding of a single pinion, the engine can be disengaged from the pump, and the former employed exclusively for other purposes.

### PRICES.

Size.	Indicated H.-P.	C	D	E	G	H	J
Engine and 3 in. cylinder	£ 12	£ 8	£ 10	£ 12	£ 15	£ 18	£ 22
Do. and 4 in. cylinder	£ 18	£ 12	£ 15	£ 18	£ 22	£ 25	£ 30
Do. and 5 in. cylinder	£ 25	£ 18	£ 22	£ 25	£ 30	£ 35	£ 40
Do. and 6 in. cylinder	£ 35	£ 25	£ 30	£ 35	£ 40	£ 45	£ 50
Do. and 7 in. cylinder	£ 45	£ 35	£ 40	£ 45	£ 50	£ 55	£ 60
Do. and 8 in. cylinder	£ 60	£ 45	£ 50	£ 60	£ 65	£ 70	£ 75
Do. and 10 in. cylinder	£ 80	£ 60	£ 70	£ 80	£ 85	£ 90	£ 95

The Prices include Feed Pumps on Engines.

The engraving represents all up to and including the E size; all above that size, the base-plate to carry whole (if required), would be extra.

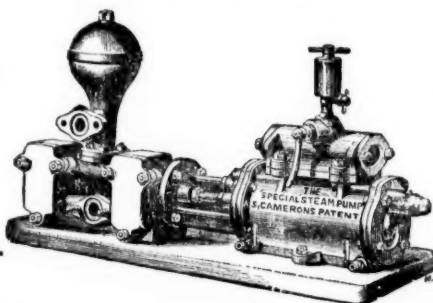


The "Special" Steam Pump, WITH VERTICAL BOILER.

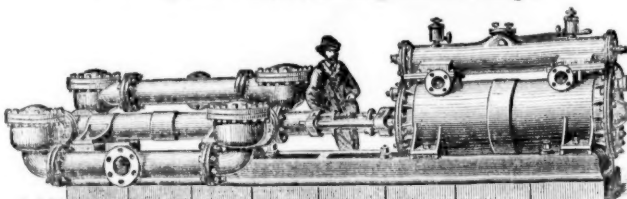
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HIGHEST PRIZE  
MEDAL  
FOR  
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FOR  
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and Combinations  
of the  
SPECIAL  
STEAM PUMPS

Are now in Stock.

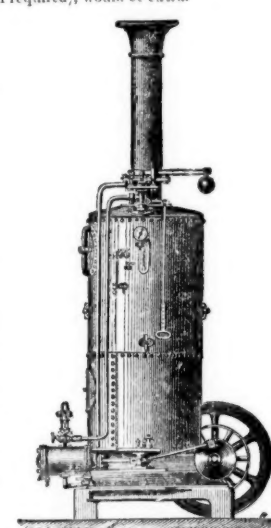


The "Special" Direct-Acting Steam Pumps.



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FOR  
STEAM ENGINES.

OVER 3,000  
OF THE  
SPECIAL  
STEAM PUMPS  
HAVE BEEN SOLD  
FOR  
Every variety of purpose,  
including over 500 in.  
DRAINING MINES.



Tangye's Horizontal Engine, WITH VERTICAL BOILER.

### PRICES OF A FEW OF THE LEADING SIZES OF "SPECIAL" STEAM PUMPS FOR MODERATE LIFTS.

Diameter of Steam Cylinder	In.	3	4	4	6	6	7	7	8	8	8	8	10	10	12	12	16
Diameter of Water Cylinder	In.	1½	2	3	3	4	6	5	7	4	6	7	8	6	7	8	10
Length of Stroke	In.	9	9	12	12	12	12	12	12	12	12	12	18	12	12	18	24
Strokes per minute		100	70	50	50	50	50	50	50	50	50	50	35	50	50	35	25
Gallons per Hour—Approximate		680	815	1830	1830	3250	7330	5070	9730	3250	7330	9750	13000	7330	9750	13000	20000
Will Feed Boilers up to (indicated) H.-P.		50	68	..	134	..	..	..	250	..	..	..	..	..	..	..	..
Dia. of Suction and Delivery	In.	1	1½	2	2	3	4	3½	5	3	4	5	6	4	5	6	8
Diameter of Steam Pipe—Inlet	In.	½	¾	1	1	1	1	1	1½	1½	1½	1½	1½	1½	2½	2½	2½
Diameter of Steam Pipe—Exhaust	In.	¾	1	1	1	1	1	1½	1½	1½	1½	1½	1½	1½	2½	2½	2½
Total Length and Width	In.	36×6	42×8	48×14	48×13	41×15	51×17	54×18	55×20	51×17	54×19	56×21	66×22	58×21	74×25	94×27	100×30
PRICE		£16	£20	£25	£30	£40	£47	£50	£57	£50	£55	£65	£85	£70	£80	£100	..

ALL  
DOUBLE  
ACTING.

SHORT  
PISTONS.

LONG  
STROKES.

ALL  
FITTED  
WITH  
HOLMAN'S  
PATENT  
BRASS  
BUFFER  
VALVES.

Any combinations can be made between the Steam and Water Cylinders to suit Pressure of Steam and Height of Lift—thus, 8 in. Steam and 3 in. Water, or 10 in. Steam and 3 in. Water, and so on. The Length of Stroke can also be increased at a proportionate extra charge.  
LARGER SIZES OF THESE PUMPS ARE SUPPLIED FOR FORCING WATER FROM MINES TO HEIGHTS UP TO 1500 FEET IN ONE LIFT. (SEE GENERAL LIST.)



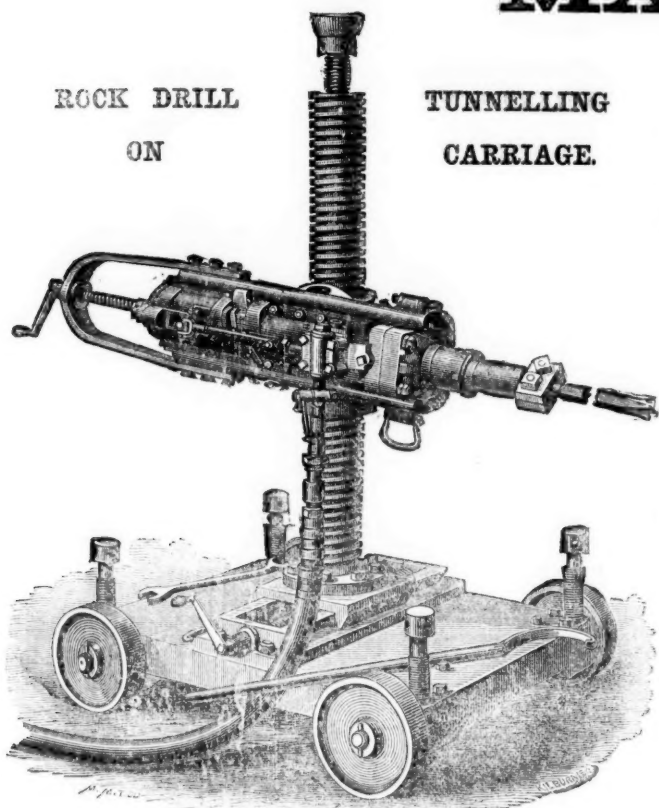


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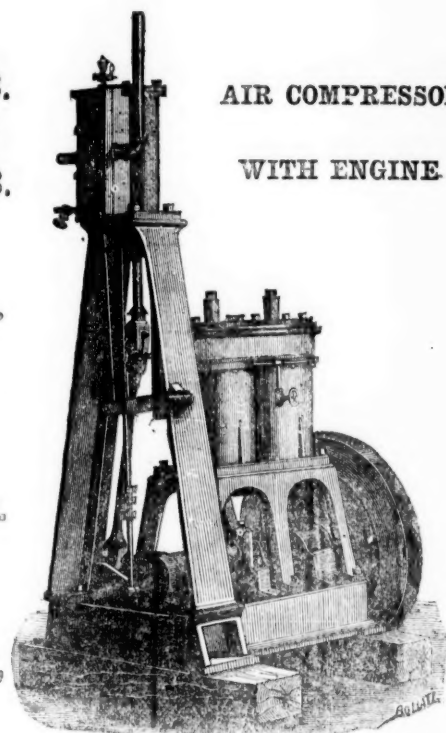
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chinery, or where the Motive Power has  
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\* Extract from Paper read before the British Association at Bradford, 1873, on Brain's System of Mining and Shafting Sinking at the Drybrook Iron Mines, Forest of Dean, using the "Burleigh" Rock Drilling and Air Compressing Machinery:  
(Shaft 10 ft. Diameter.)

#### COST OF SHAFT BY HAND

During a Fortnight.

Sinkers, twelve, 12 days each, at 5s. 6d. . . . .	£39 12 0
Water Fillers, three, 12 days each, at 3s. 6d. . . . .	6 6 0
Blasting powder . . . . .	1 2 0
Total . . . . .	£47 0 0

Depth Sunk 3 yards—Cost per yard . . . £15 13s. 4d.

#### COST OF SHAFT BY MACHINE

During a Fortnight.

Sinkers, three, 12 days each, at 5s. 9d. . . . .	£10 7 0
Labourers, six, 12 days each, at 3s. 6d. . . . .	12 12 0
Engine Stokers, two, 12 days each, at 2s. 6d. . . . .	3 0 0
Dynamite, 60 lbs., at 2s. . . . .	6 0 0
Electric Fuses (Brain's) 20 per day, at say 6d. each . . . . .	6 0 0
Coal for Air Compressing Engine, 12 tons small, at 10s. . . . .	6 0 0
Oil for engines . . . . .	0 5 0
Total . . . . .	£44 4 0

Depth Sunk 5 yards—Cost per yard . . . £8 16s. 9d.

THE ABOVE STATEMENT REPRESENTS WHAT IS NOW BEING DONE AT THE ABOVE MINE.

#### ADDITIONAL TESTIMONY.

(COPY.)

Messrs. T. BROWN &amp; Co., 96, Newgate Street, London, E.C.

DEAR SIR,—I have much pleasure in informing you that the Rock Drill and High-pressure Boiler, with which you supplied us, are both working extremely well.

I am, yours truly,

(For the Weardale Iron and Coal Company, Limited),

J. R. CRONE.

The Weardale Iron and Coal Company, via Darlington, Sept. 6th, 1873.

(COPY.)

DEAR SIR,—In reply to yours of 2nd inst., I am sorry I have not time to go into the comparative results of hand labour in sinking with that of the work done by your "Burleigh Drill." All I can say is, that for the last few months it has been giving me every satisfaction, and there is a marked difference in the progress of our sinking operations.

I am, yours truly,

JOHN MAIN.

\* The Paper can be had upon application to **THOMAS BROWN & CO.,** 96, Newgate Street, London, E.C.



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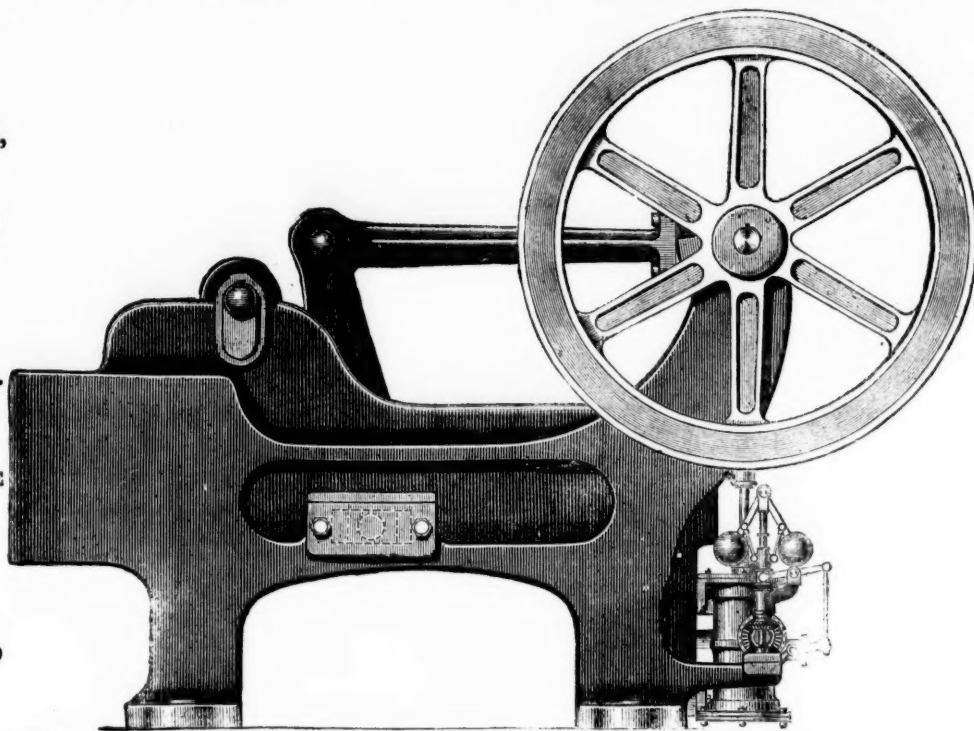
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